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TEXTILE WORLD RECORD

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LORD & NAGLE COMPANY · Boston & Philadelphia

COPYRIGHT, 1903, LORD & NAGLE COMPANY.

The American Directory of the Knitting Trade for 1904 is now in press. Ready this month.

The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the warp or chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING

DYEING

DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Patent Combination Rolls made of Cotton and Husk especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

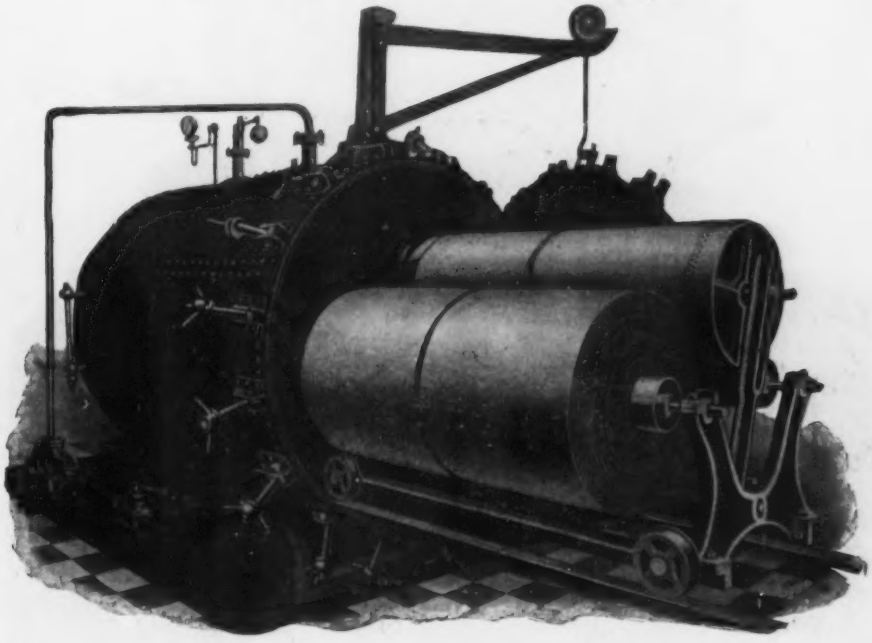
Estimates, drawings and full particulars of complete plants furnished on application

Open Bleaching System

OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
U. S. Patent, January 15th, 1901. No. 666,056



H. W. Butterworth & Sons Co.

Manufacturers of

Bleaching, Dyeing, Drying and Finishing Machinery

YORK AND CEDAR STREETS

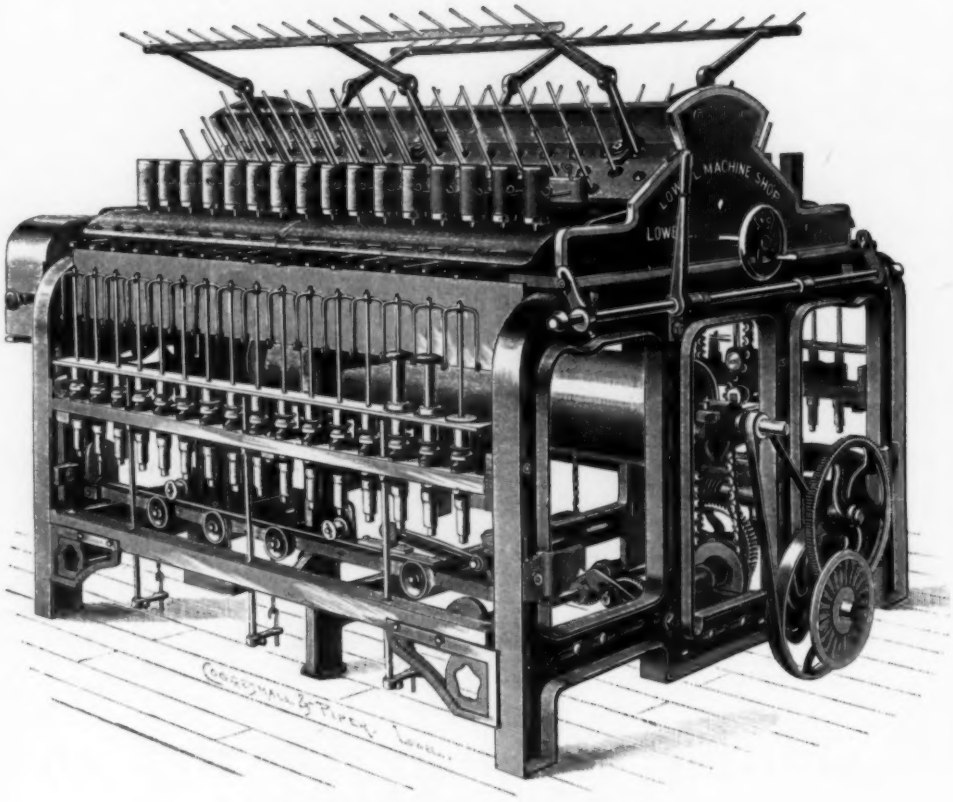
PHILADELPHIA

Sole Makers for the United States

Worsted Machinery

Made in the

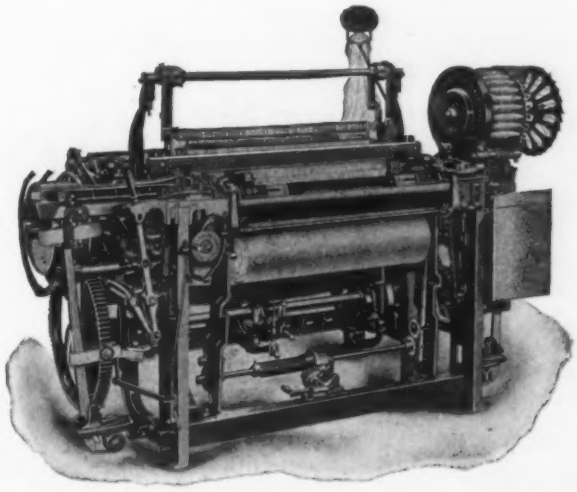
United States



Worsted Flyer Trap Twister

Lowell Machine Shop

Lowell, Mass.



THE J MODEL LOOM

DESIGNED exclusively for Print Cloths and similar light fabrics. Will weave without a thick or a thin place. Can bang off without shock. Has the large hopper, the Draper-Roper let-off, a new take-up and a new warp stop knock-off.

Large orders now being filled by the

DRAPER COMPANY,

Hopedale, Mass.

OUR LATEST!

AUTOMATIC FILLING STOP MOTION

This attachment will positively stop the loom just before filling runs out, leaving absolutely no mispicks, and it can be attached to any loom.

It can be seen in operation at our works, where we have also on exhibition our

Automatic Shuttle Changing Device.

THE ASALA COMPANY.

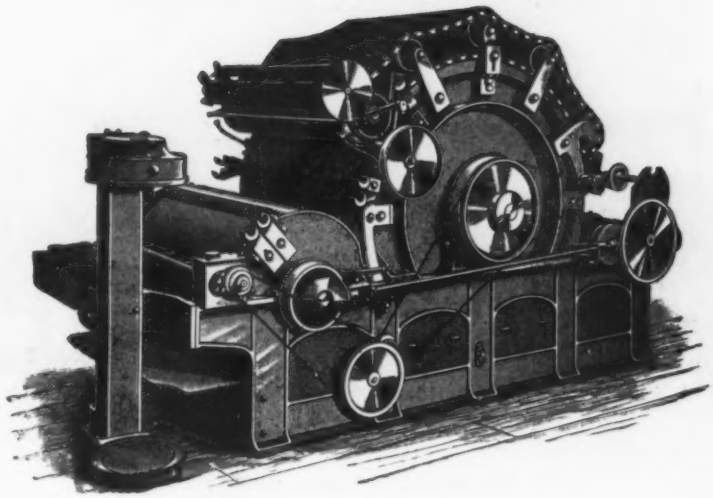
Works:
Slatington, Pa.

New York Office:
415 Broadway.

MASON MACHINE WORKS,

TAUNTON, MASS.

Cotton Machinery



Cards, Combers, Railway Heads, Drawing Frames, Spinning Frames, Mules and Looms,

INCLUDING

Plain and Fancy Silk Looms

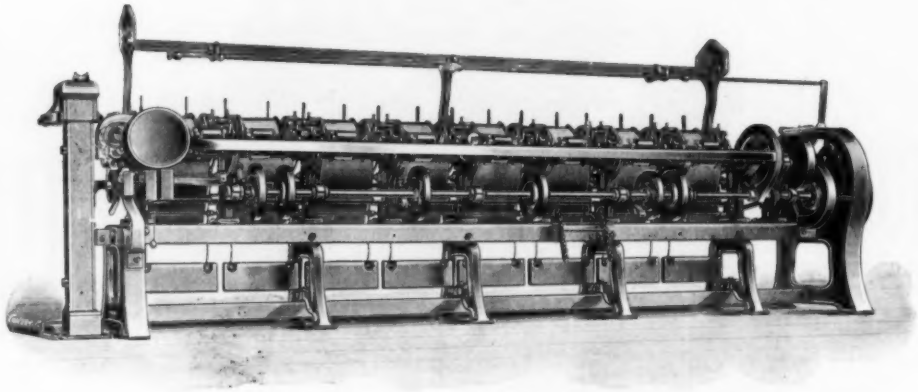
Southern Office, Charlotte, S. C.

THE

WHITIN MACHINE WORKS,

Cotton Machinery

WHITINSVILLE, MASS.



The Whitin 8 Head Comber.

Southern Agent, . . . S. W. CRAMER

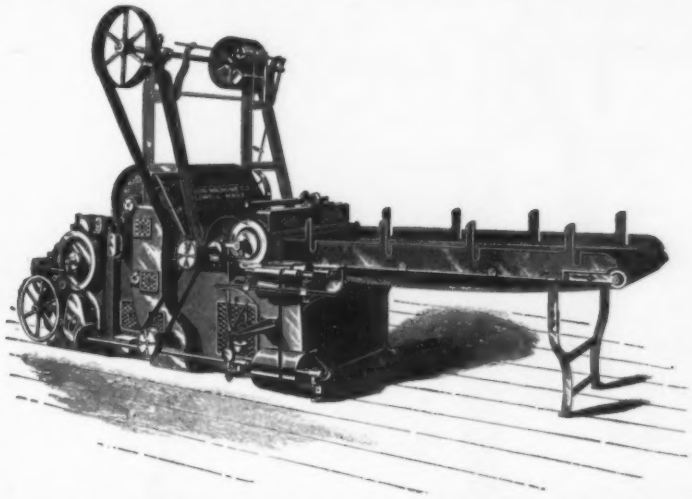
Trust Building, CHARLOTTE, N. C.
and Equitable Bldg, ATLANTA, GA.

Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines,
Combers,
Railway Heads,
Drawing Frames,

Spinning Frames,
Spoolers,
Twisters,
Reels,
Looms,
Long Chain Quilling Machines.

The Best Pickers

In the Cotton Field nothing equals the DARKY COTTON PICKERS.



In the Cotton Mill nothing equals the KITSON COTTON PICKERS.

KITSON MACHINE CO., LOWELL, MASS.

LARGEST BUILDERS OF COTTON OPENERS AND LAPPERS IN THE WORLD.

STUART W. CRAMER, Southern Agt., Charlotte, N. C. and Equitable Bldg., Atlanta, Ga.

SCOTT & WILLIAMS

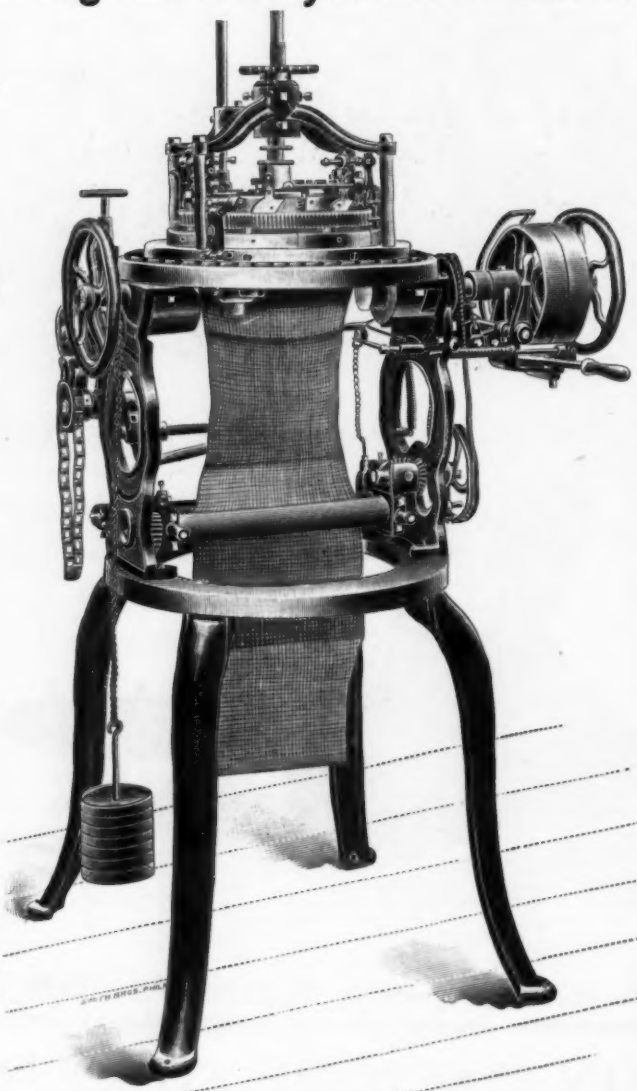
BUILDERS OF

Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes, 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

We build Loopers, Ribbers and other Machinery for Knitting Mills

As well as

A Complete Line of Full Antomatic and 7-8 Automatic Seamless Hosiery Machinery.

Full Particulars, Samples and Special Catalogues on Application.

2079 E. Cumberland Street, Philadelphia, Pa., U. S. A.

BRANSON MACHINE CO.

BUILDERS OF

KNITTING MACHINERY

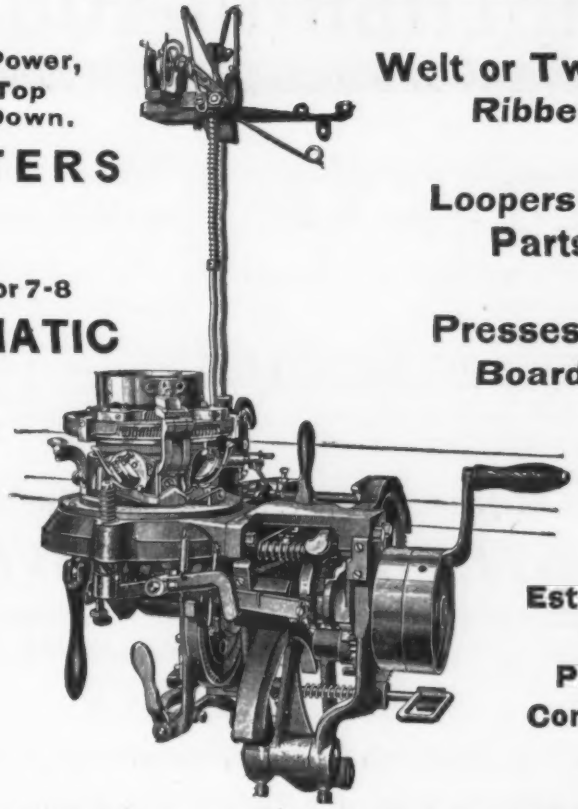
Hand or Power, Open Top or Hold Down.

KNITTERS

1-2, 3-4 or 7-8

AUTOMATIC KNIT-TERS

All Sizes and All Gauges.



Welt or Two-Feed Ribbers.

Loopers and Parts.

Presses and Boards.

Estimates for Plants Complete.

Winders and Bobbins.

Hand Forged Steel Cylinders.

BRANSON MACHINE CO.

504 North American Street, : : Philadelphia, Pa.

Write for Information and Catalogue.

Our Fire-Proof Metal Mule Carriage

reduces the danger from fire in the mule head to a minimum, and makes

HETHERINGTON'S

mule spinning more desirable than ever.

Our new Comber is selling beyond anticipations; 300 are now working and giving entire satisfaction.

None better in the world! The opinion of Thomas Ashton, England's great labor leader and member of the British Labor Commission, of the Mule Room at the Soule Mill, New Bedford, Mass., to the "Evening Standard" reporter on Nov. 25, 1902.

These Mules were Sold and Installed by

STEPHEN C. LOWE

186 Devonshire Street, .. Boston, Mass.

Agent for JOHN HETHERINGTON & SONS, Limited, Manchester, England.

Cards, Drawing, Slubbing, Intermediate and Roving Frames.

Combers, Lap and Ribbon Lap Machines.

Improved Heilman Combers. Over 4,000 running in U. S. A.

Catalogues, Information and Estimates on Request.

A FULL LINE OF PARTS FOR ALL OUR MACHINERY

Constantly in stock.

EVAN ARTHUR LEIGH

232 Summer Street (opposite the South Station), Boston, Mass.

SOLE AGENT IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt's New Patent Cotton Comber will comb from 7-8 in. stock to Sea Islands.
Platt's Special Machinery for Making French Worsted Yarns.
Platt's Special Machinery for Making Cotton Waste into Yarns.
Platt's Woolen and Worsted Carding Engines, Special Designs.

MATHER & PLATT, LTD.

Dyeing and Finishing Machinery. Archbutt-Deeley System for purifying and softening water.

TEXTILE MACHINERY ASSOCIATION, LTD.

Flax, Hemp and Jute Machinery.

THE PATENT AUTOMATIC FEEDING MACH. CO., LTD.

Patent Feeding Machines for wool, cotton, flax, fur and fibrous material.

GEORGE HODGSON, LTD.

Looms for Worsteds, etc.

JOSEPH SYKES BROS., Card Clothing for Cotton.

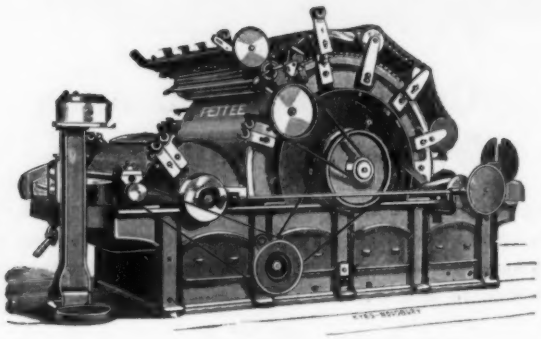
JAMES CRITCHLEY & SON'S, Card Clothing for Woolen and Worsted.

DRONSFIELD BROS'. Grinding Machinery and Emery Filleting.
The best French and English Combing and Rubbing Aprons.
Harding's Pins and Circles, Varey's Fallers, etc.

Saco and Pettee Machine Shops

NEWTON UPPER FALLS, MASS., U. S. A.

COTTON MACHINERY



PICKERS,
REVOLVING FLAT CARDS,
DRAWING FRAMES,
RAILWAY HEADS,

SLUBBING,
INTERMEDIATE AND ROVING FRAMES,
SPINNING FRAMES,

SPOOLERS AND REELS.

Shops: { **Biddeford, Me.**
Newton Upper Falls, Mass.

Southern Agent, A. H. WASHBURN, Charlotte, N. C.

FOR HOSIERY YARNS

BROADBENT & BRIGHAM'S

Patent Conical and Parallel

Drum Winders

Any traverse from 2 1-2 in. up to 10 in. ARRANGED WITH STOP MOTIONS UP TO SIX ENDS. For first cost, production, quality of work, and cost of winding, it has no equal.

OUR NEW WINDER

12 spindles to a machine any traverse from 2 in. up to 8 in. builds both cones and parallel tubes either the close or open wind, single or many ply from cops, bobbins, or skeins. Production and quality unsurpassed. Samples, prices and full particulars furnished on application.

Machines Carried in Stock for Immediate Delivery.

ARTHUR A. BRIGHAM

186 Devonshire Street

BOSTON, .. MASS.

WINDERS

DR. J. B. HARRIS' SYSTEM

Absolute Combustion of Soft Coal in Steam Boiler Furnaces. . . . NO SMOKE!

Saves Fuel.

Flues and Sheets Always Clean.

Gives Higher Evaporation.

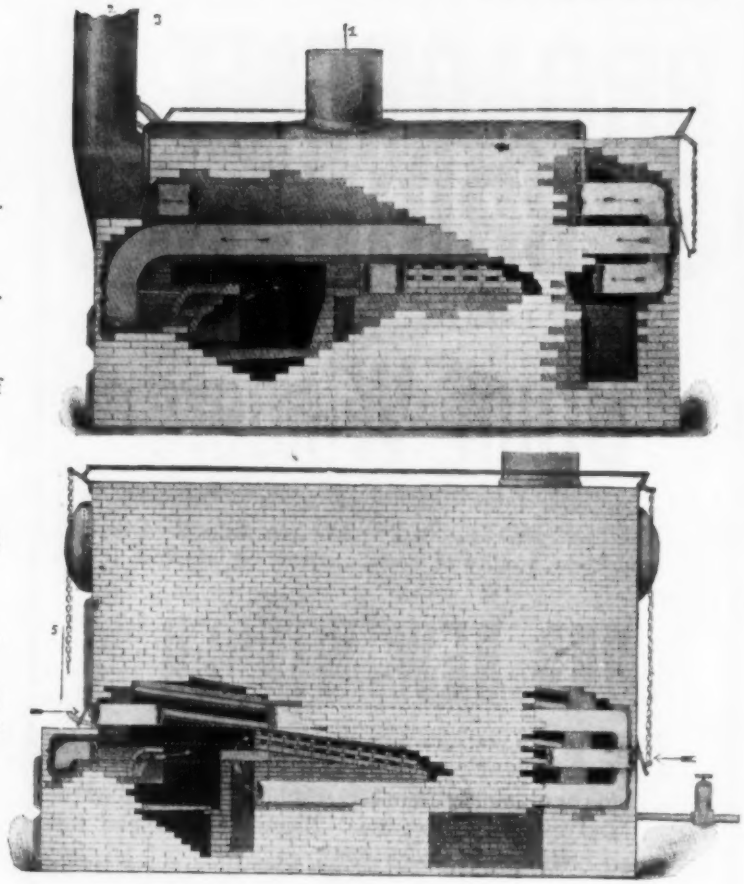
Burns Any Kind of Fuel.

Low in First Cost.

Repairs Nominal and Easily Made.

Durable and Efficient.

Burns Crude Oil Without Smoke or Odor.



GENERAL AGENTS:

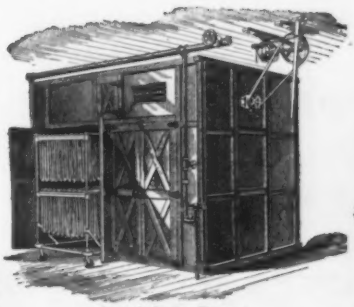
INTERNATIONAL STEAM ENGINEERING COMPANY.
NEW YORK: 1110 Washington. Life Bldg., 141 Broadway. ATLANTA, GA., 528-9 Prudential Building.
W. G. & G. GREENFIELD, Greenfield Steam Engine Works, 5th and Cross Streets, EAST NEWARK, N. J.
ADAM DeTRAMPE, 424 New Land Title Building, PHILADELPHIA, PA.
STANLEY ADAMS & CO., 4 and 5 Board of Trade Building, LOUISVILLE, KY.

Catalogue free of nearest agent or address

J. B. HARRIS, M.D., Inventor and Patentee,
71 Arcade, NASHVILLE, TENN.

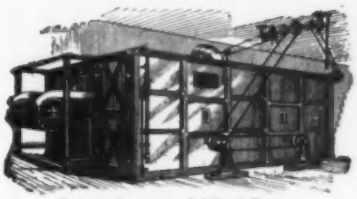
"HURRICANE" DRYERS AND FANS

For WOOL, COTTON STOCK, YARN, STOCKINGS, UNDERWEAR, Etc.



Truck Yarn Dryer.

Write for Booklets.



Cotton Stock and Wool Dryer.

CARBONIZING

Outfits for Wool, Noils, Rags and Cloth.

"Hurricane" Fan, Style No. 2.

PHILADELPHIA DRYING MACHINERY CO.

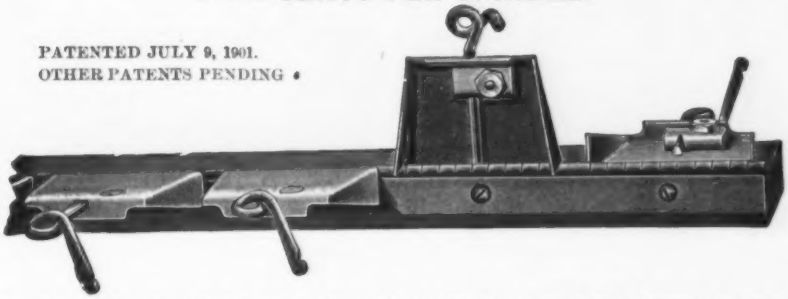
6721 Germantown Ave., Philadelphia, Pa.

HOUGHTON'S ALL STEEL THREAD BOARD

with Hardened Thread Guides.

7 1-2 CENTS PER SPINDLE.

PATENTED JULY 9, 1901.
OTHER PATENTS PENDING



The only Thread Board that *holds a guide solid* all the time; *never* gets loose; is always in perfect adjustment, and thus must make a saving in travelers, broken ends, waste, thread guide, care and also prolong the wear of rings and increase the production per spindle. These claims are based on the truth of mechanical principles, and have been proven true by actual use in many mills whose superintendents will substantiate these claims.

L. T. HOUGHTON, Sole Manufacturer, WORCESTER, MASS.

THE

A. T. ATHERTON MACHINE CO.

PAWTUCKET, R. I.

The Leading Manufacturers of

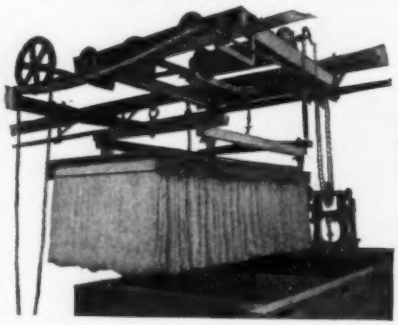
PREPARATORY COTTON MACHINERY

The Hussong Dyeing Machine

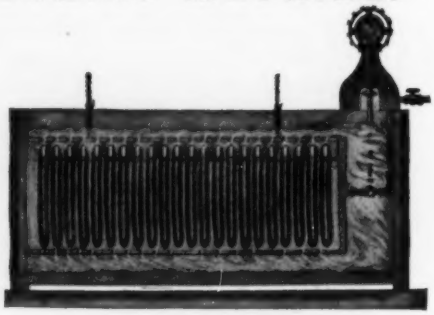
Patented Nov. 6, 1900. April 9, 1901.

For Dyeing both Alizarine and Acid Colors on Yarn.

A PERFECT SKEIN DYEING MACHINE.



This illustration shows our Compressed Air Hoisting Carriage, with 300 pound Yarn Machine suspended.



Longitudinal Sectional View, showing the circulation of dye-liquor through the yarn when in operation.

Points of Superiority Which We Claim for the Hussong Machine.

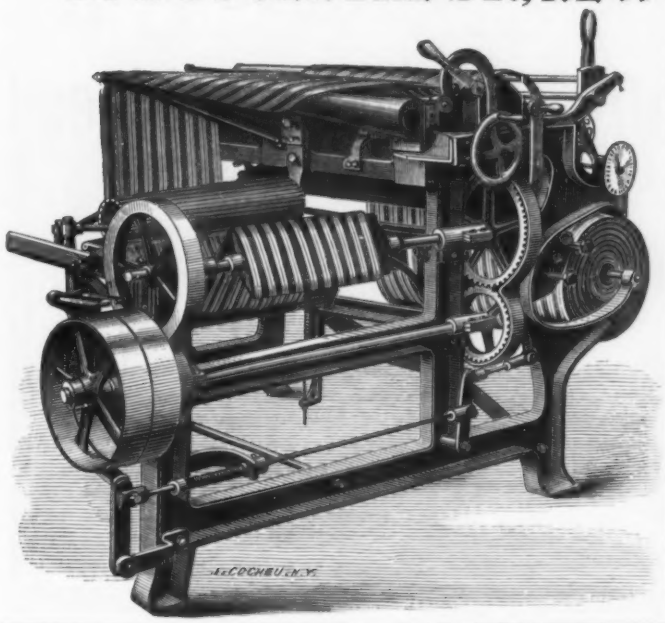
Durability, Even Dyeing, Saving of Steam, Saving of Dyestuff,
Saving of 75% in Labor, Makes No Waste Whatever, No Friction on the Material,
Requires but Little Power to Operate,
Leaves the Yarn and Slubbing in its Natural Condition.

Built by the AMERICAN DYEING MACHINE COMPANY, Office 609 Pearl St., Camden, N. J.

Reference Given on Application.

Fabric Measuring & Packaging Co.

82 & 84 CENTRE ST., NEW YORK, U.S.A.



Machines to Print Trademarks

On Cottons, Woolens and Carpets.

Machines to Measure

and imprint the measurement upon fabrics, fold lengthwise and roll into merchantable packages all in one operation.

Prevents claims for short measure.
Marks piece numbers on each package.

A Fully Equipped Machine Shop for General Work.

THE OLD WAY.

Oiling stock with a tin can with holes punched in the bottom, or a watering pot. Wasteful of oil and labor and seldom done twice alike, but is still used in some mills.

What Changes!

THE MODERN WAY.

Oiling and dampening stock with the Spencer Automatic Oiler applied to feed table of wool picker, lumper or lapper. Batches treated as desired. Perfect regulation.

Not much need to dwell upon the advantages of the automatic system, by which uniform results are obtained with saving of oil and labor, as compared with the sloppy, guess work, waterpot system.

It's the story of the Bramwell and Apperly feeders over again. How many mills are feeding by hand to-day? There will be very few oiling by hand in a few years. Hundreds of the best mills are using the Spencer Oiler to-day. Are you? If not, send for particulars.

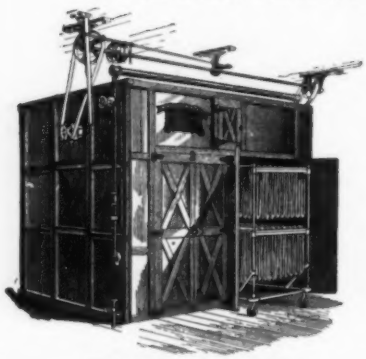
GEORGE S. HARWOOD & SON, 53 State St., Boston.

AMERICAN DRYING MACHINERY CO.

MANUFACTURERS OF

"20th Century" Drying Machines

FOR WOOL, COTTON, STOCK, YARNS, HOSIERY AND UNDERWEAR.



TRUCK YARN DRYER.

Carbonizing Plants Complete;
Yarn Scouring Machines,
Ventilating Fans, Etc.

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PHILADELPHIA, PA.

CORRESPONDENCE SOLICITED.

Fairbairn Lawson Combe Barbour, Ltd.

LAWSON BRANCH,

Hope Foundry. **LEEDS.** **England.**

MAKERS OF MACHINERY FOR

PREPARING AND SPINNING FLAX, HEMP, TOW AND JUTE

AND OF

Special Machinery for the Manufacture of Twines,

ALSO OF

GOOD'S COMBINED HACKLING AND SPREADING MACHINE,

LONG REACH SCREW-GILL DRAWING FRAMES,

CHAIN-GILL DRAWING FRAMES with Apron Head,

PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,

AND OTHER

Special Machinery for the manufacture of Rope Yarns and Binder Twine.

IMPROVED LAYING MACHINES. HASKELL-DAWES TUBING TWISTERS

BROWNELL'S PATENT TWISTING AND LAYING MACHINES FOR TWINE.

Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.

43 at one plant

43 BURT EXHAUST HEADS in use at the Baldwin Locomotive Works, Phila., Pa.

We want YOU to use one. If you do, and there are other exhaust pipes at your plant, you will use more than one . . . The BURT EXHAUST HEAD gives perfect satisfaction is the verdict of all users.

Order today, with size of pipe.
Dissatisfied, return.

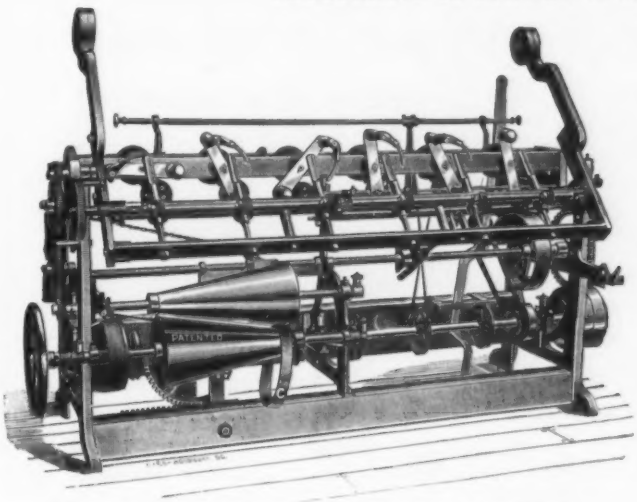
The BURT MFG. CO. LARGEST MANUFACTURERS OF OIL FILTERS IN THE WORLD.

214 Main St., AKRON, OHIO, U. S. A.

SUPPLIED ALSO BY ENGINE BUILDERS, DEALERS AND POWER CONTRACTORS.

NORTH CHELMSFORD MACH. CO.

Successors to SILVER & CAY CO.



MANUFACTURERS OF

BALLING MACHINES
QUILLERS,
REELS,
BALING PRESSES
AND
SPECIAL COTTON MACHINERY.

SPECIAL — AUTOMATIC BALL WINDER.
Adapted to All Kinds of Twines, Silks and Floss.

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ALBERT BIRCH,
Manager.

TEXTILE FINISHING MACHINERY

WORKS ON LINE OF FITCHBURG RAILROAD
No connection with any other concern. Our only place of business for 15 years is at
SOMERVILLE, MASS.,
to which place please address your enquiries.

BIRCH BROTHERS COMPANY

SOMERVILLE MACHINE WORKS,

WOOLEN and WORSTED FINISHING MACHINERY

And also for

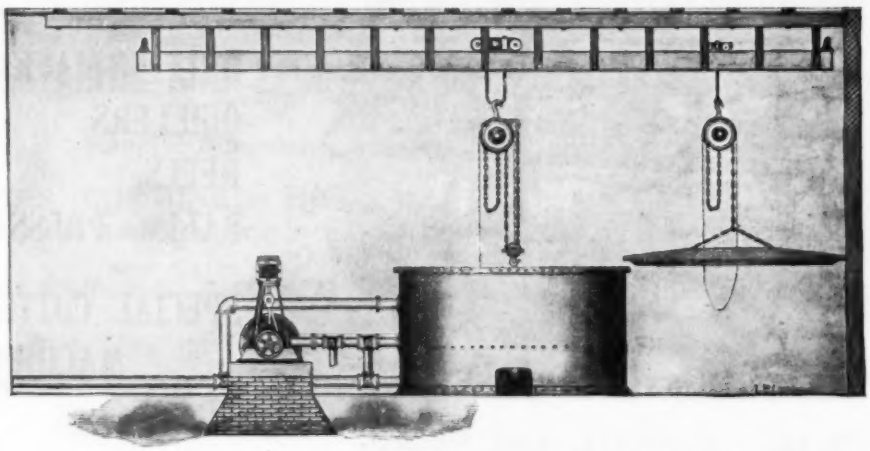
BLEACHING, DYEING, DRYING and FINISHING COTTON GOODS.

Send for Circulars and Prices.

SOMERVILLE, MASS.

VACUUM DYEING MACHINE CO., CHATTANOOGA, TENN.

RAW STOCK, YARN AND HOSIERY **DYEING MACHINES**



OFFICE OF TREMONT & SUFFOLK MILLS, LOWELL, MASS., Jan. 14, 1904.

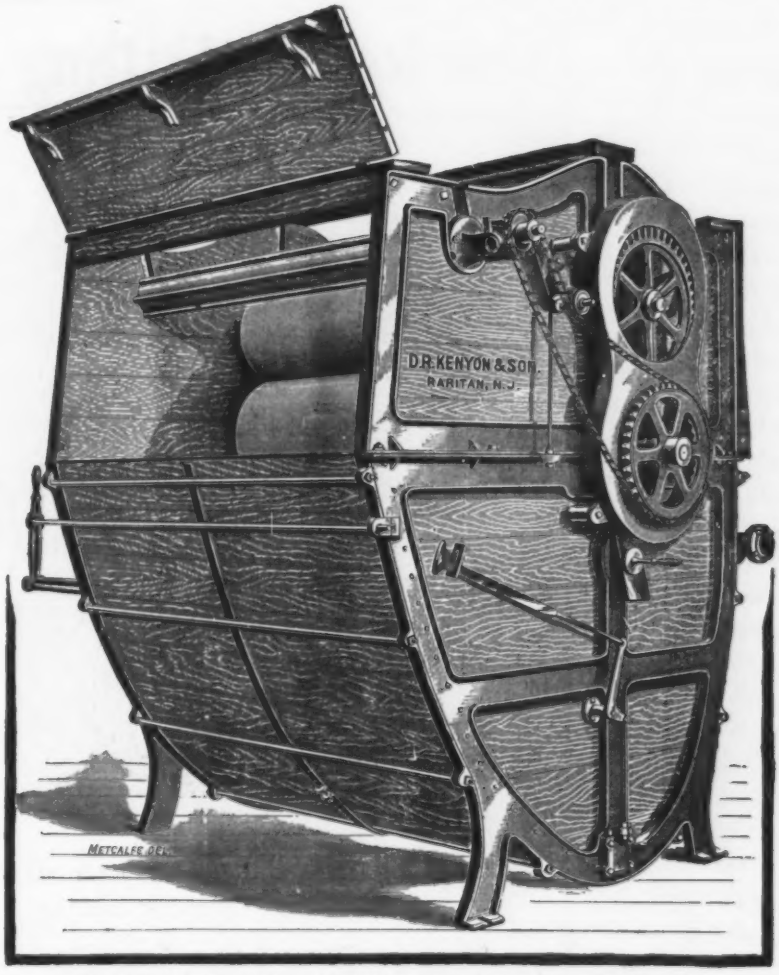
VACUUM DYEING MACHINE CO., Chattanooga, Tenn.

GENTLEMEN: Replying to your inquiry in regard to what we think of your Raw Stock Dyeing Machine, would state that we have been using one about six months, with very satisfactory results, the dyeing being level, and the stock left in first-class condition for spinning. Can give your machine no better recommendation than to say, we think so well of it that we have just placed an order for two additional machines.

Yours truly, J. J. CONNELL, Agent.

Kenyon's Improved Cloth Washer

FOR FOUR, SIX OR EIGHT STRINGS OF GOODS



BEST QUALITY SOLID ROLLS.

Improved trough and valves, preventing wash of liquor and insuring quick and thorough scouring and rinsing.

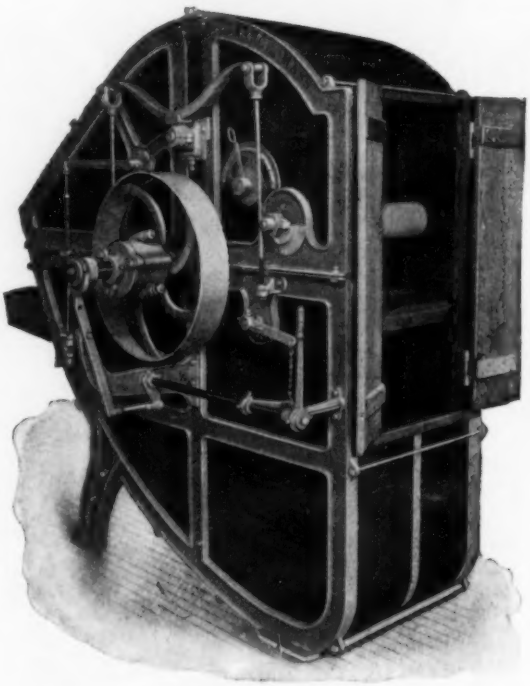
D. R. Kenyon & Son, RARITAN, N. J.

BUILDERS OF WOOLEN MACHINERY

RODNEY HUNT MACHINE COMPANY

WATER WHEELS,
Horizontal and Vertical.
Iron Flumes and Penstocks.
Rotary Fire Pumps.
Centrifugal Pumps.
Head Gate Apparatus.
Water Wheel Regulators.
Rotary Fulling Mills.
Rotary Cloth Washers.
Rotary Knit Goods Washers.
Combined R'y Fulling Mill
and Washer for Knit Goods.
Endless Felt R'y Washers
and Rotary Felling Mills.
Hammer Falling Stocks.
Dolly Washers.
Crank Fulling Mills.
Crank Knit Goods Washers.
Wringing and Rinsing Mchs.
Reel Dyeing Machines.
Carbonizing Machines.
Bleaching Machines for
Chloride of Lime and
Peroxide of Sodium,
Dye Tubs and Rinsers.
Wool Washers.
Soaping Machines.
Cloth Winders.

New Rotary Fulling Mill



Type T. Common Capacity for all Fabrics. Circular No. 13.

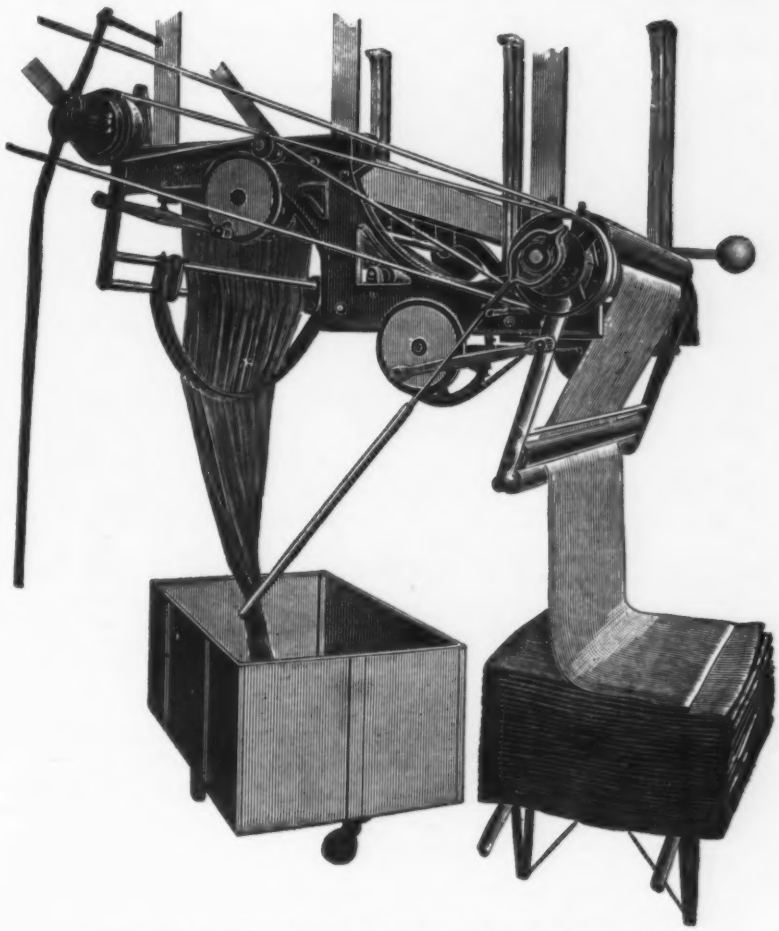
Type S. Extra Large Capacity for all Fabrics. Circular No. 12.

Write for our Special Circulars with Large Illustrations and Full Description of Our Machines.

Boston Office,
70 KILBY STREET,
Telephone No. 1522.

Main Office and Works,
ORANGE, MASS.

The Hunter CLOTH OPENER AND FOLDER



ONE MAN CAN OPEN AND FOLD MORE GOODS IN A DAY WITH THIS MACHINE THAN FOUR MEN CAN DO BY HAND.

No stretching or beating of goods under tension. All the parts coming in contact with cloth are brass or wood.

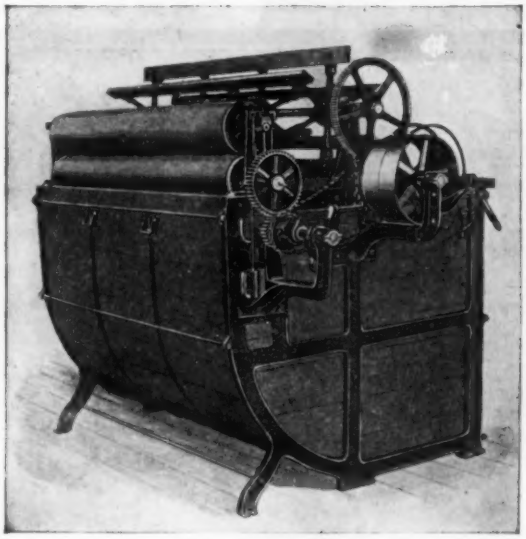
Opens any width of cloth from 63 inches down to 30 inches. Can be built wider for blankets.

James Hunter Machine Co., North Adams, Mass.

YOU WANT THE BEST. WE BUILD THEM.

CLOTH WASHERS

FULLING MILLS



1903 PIECE DYEING MACHINE.

Piece Dyeing Machines,
Dye Tubs, Vats,
Tanks, etc.

HOPKINS MACHINE WORKS

PROVIDENCE AND BRIDGETON, R.I.

PROVIDENCE OFFICE

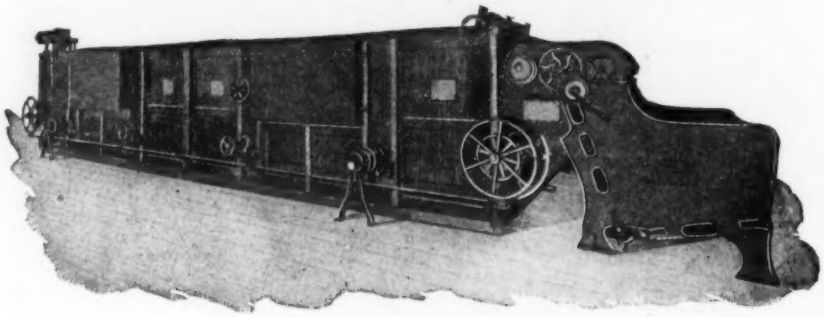
49 Westminster Street.

Our machines are up to date.
Patented features found in no others.
Most effective and economical machines built.

Send for Catalog, Prices, and also ask about our fulling mill for extra heavy goods and blankets.

C. G. SARGENT'S SONS,

GRANITEVILLE, MASS.



... BUILDERS OF ...

Stock Dryers, Wool Washers,
Wool Dusters, Carbonizing Plants,
Burr Pickers, Etc.

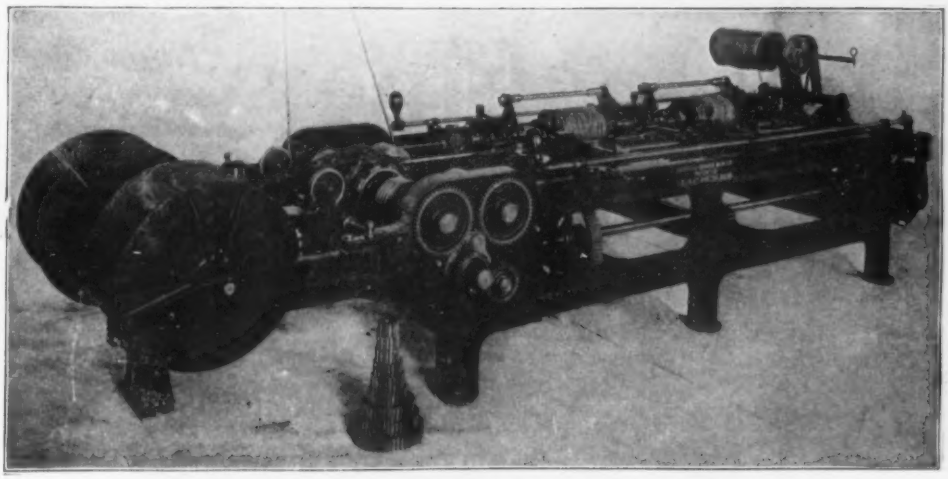
THE HASKELL-DAWES MACHINE CO.

Manufacturers of the best types of

Forming, Twisting and Laying Machinery

Which are adapted for making all kinds of

COTTON CABLE-LAID TWINE, CORD and ROPE



The Haskell-Dawes Machines are built upon a NEW PRINCIPLE, whereby the MOST POSITIVE RESULTS ARE SECURED. They occupy LESS SPACE than the ordinary type of machines, require LESS RELATIVE POWER, and will turn out a MUCH LARGER PRODUCT of Twine and Rope. The SPECIAL ATTENTION of Cotton Manufacturers is called to our new FORMING AND ROPE-LAYING MACHINES. Descriptive Catalogue Sent on Application.

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NEW ENGLAND BUTT COMPANY,

304 PEARL ST., PROVIDENCE, R. I.

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ALL STYLES AND KINDS FOR FLAT AND ROUND BRAIDS.

SOLID SASH AND CURTAIN CORDS,

SHOE AND CORSET LACES, BANDING

AND ALL BRAIDED FABRICS.

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Builders of Textile Machinery

FILLING COP WINDING MACHINES. Spindles driven by belts or by gears, and bobbins can be made to wind any kind of filling from the coarsest to finest numbers, from Skeins, Spools, Cones, Mule Cops, or any other Spinning or Twister Bobbins. These machines can be arranged to wind cops or butts from the largest used in weaving to the smallest cops or butts for cotton filling used in the silk trade.

OUR MACHINERY PUTS YARN IN CONDITION FOR MANUFACTURING AS SHOWN ABOVE.

BANDLESS SPINDLE SPOOLING MACHINES; adapted to the finer grades of yarn and to the finest silk. ***PRESSER DRUM SPOOLING MACHINES;*** arranged to spool in any way the trade requires. ***BANDLESS VARIABLE SPEED MACHINES;*** to wind the large bobbins used in knitting mills. ***CONICAL AND STRAIGHT TUBE WINDING MACHINES; BRASS BOBBIN WINDING, SPOOLING, WARPING*** and other machinery for lace mills. Beaming Machines, Sectional Warp Mills, Chenille Cutting Machines, etc., etc.

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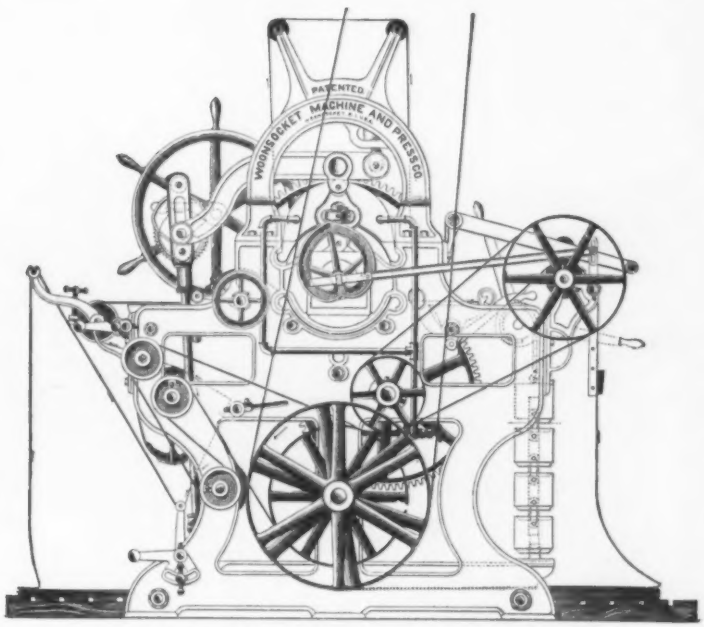
Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE

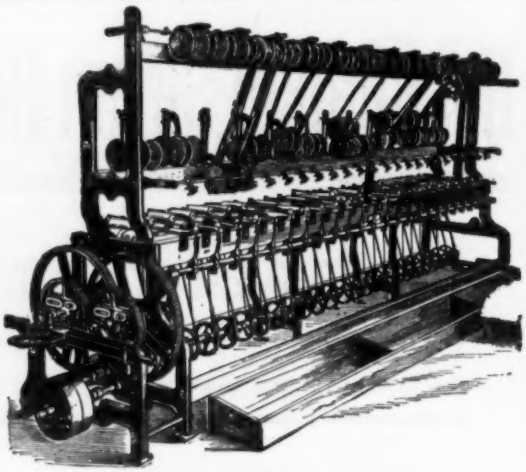


THE WOONSOCKET ROTARY PRESS.

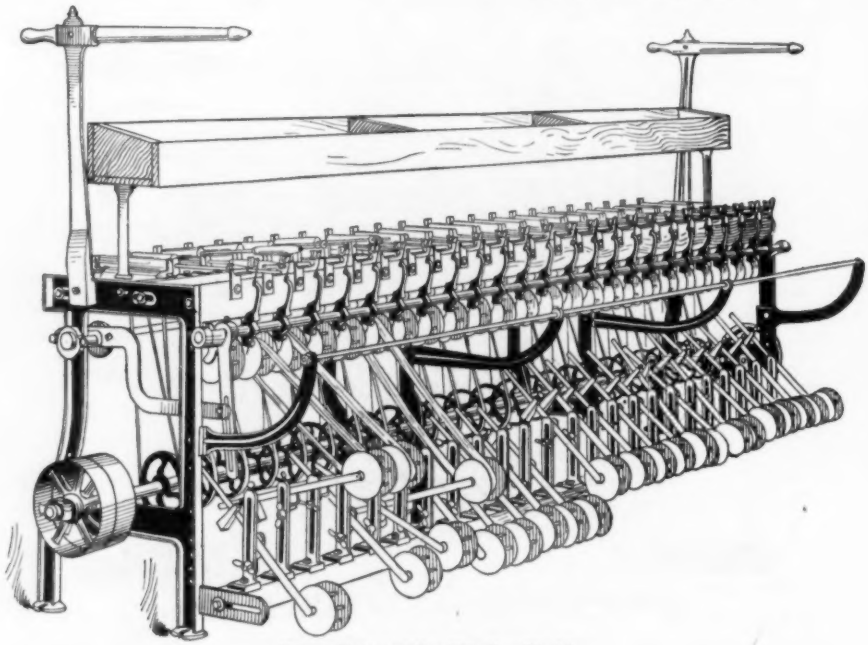
Woonsocket Machine and Press Company

WOONSOCKET, R. I,

SPOOLING, WINDING, WARPING AND BEAMING MACHINERY



Patent Shuttle Bobbin Winder for Skeins, with Patent Variable Motion.



Patent Butt and Cop Winding Machine.

JACOB K. ALTEMUS,

2818 North 4th Street, PHILADELPHIA, PA.

FULL PARTICULARS ON APPLICATION.

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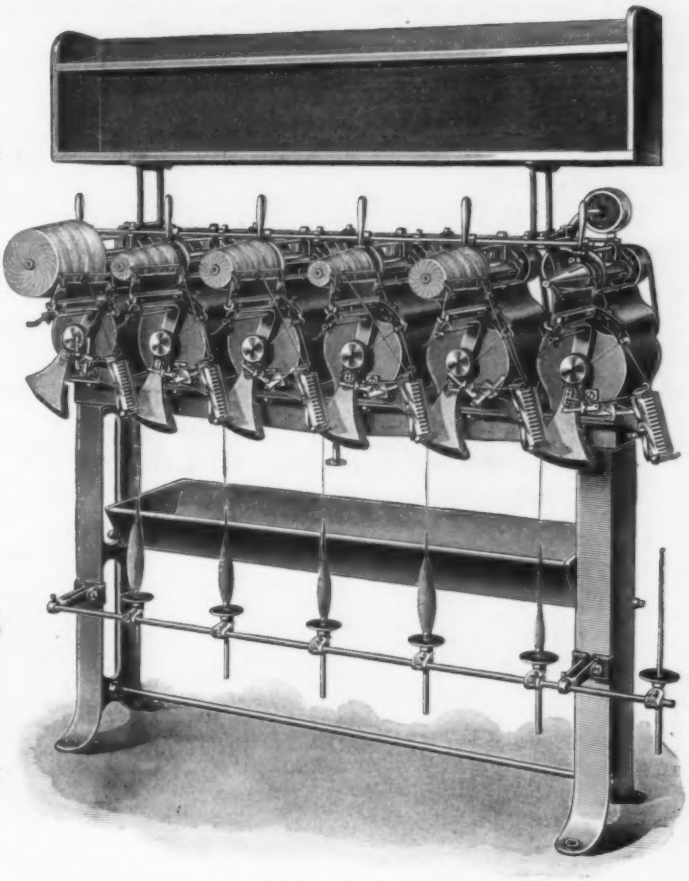
Twentieth Century Winding Machine

Our New
No. 50 Machines
Wind Cones
for
Knitting and
Double Fine Yarns
Twisting.



FLOOR SPACE 4' 8" x 1' 8"

They Combine { **Durability, Compactness, Simplicity, Economy.**

Fitted with such delicate tension devices that the finest yarns are wound without strain at high speed.

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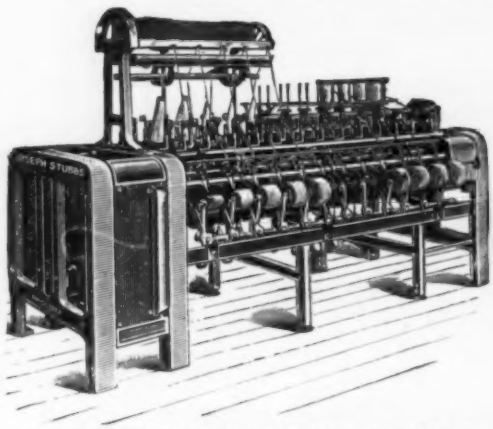
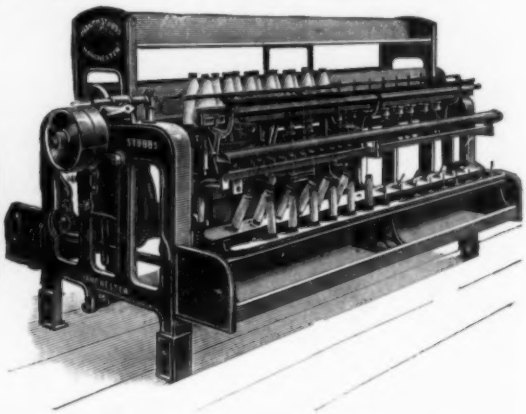
JOSEPH STUBBS, . . Manchester, England,

SPECIAL MACHINERY,

For Winding Gassing, Reeling, Preparing, Polishing and Bundling Yarns.



PATENT QUICK TRAVERSE COTTON GASSING FRAME.



IMPROVED RABBETH SPINDLE WINDER. With Patent Tapering Motion, for Single Flanged Bobbins.

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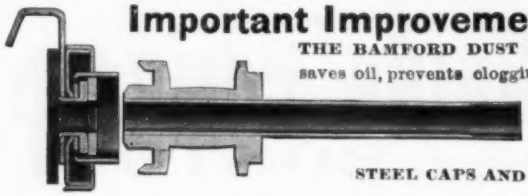
Important Improvement in Worsted Spinning.



THE BAMFORD DUST PROOF and SELF-LUBRICATING SPINDLE TUBE saves oil, prevents clogging with dust and lint, thereby insuring longer life to the tubes, saves labor, maintains uniform speed, and most important of all, makes PERFECT YARN. Refer to largest worsted mills.

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Equitable Bldg., Boston, Mass.

Received the HIGHEST AWARD on recomendation of the FRANKLIN INSTITUTE for

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Is the largest manufacturer of HUMIDIFIERS in the World. The last twenty years receiving the HIGHEST AWARDS in this country and Europe for its AIR-MOISTENING SYSTEM. EIGHT GOLD MEDALS and others.

The Only Perfect System of Air Moistening

And Has Been Adopted by the Representative Manufacturers of this Country.

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Also Power Transmission Supplies for General Mill Use.

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Allentown Reed, Harness and Mill Supply Co.
Allentown, Pa.

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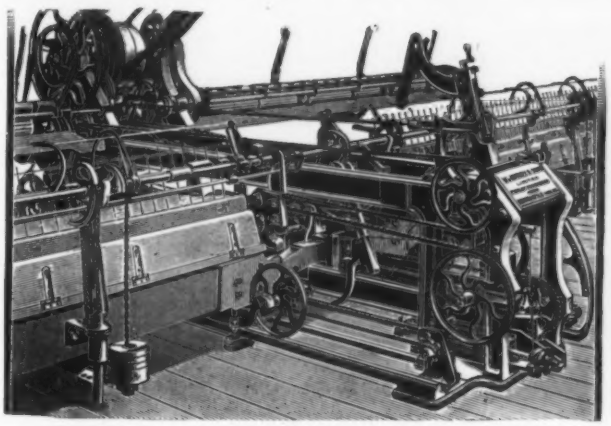
Wm Whiteley & Sons Ltd.

LOCKWOOD, HUDDERSFIELD.



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Moore & Whiteley's Patent Wool and Cotton Dryer.

Crabbing or Winding-on Frames.

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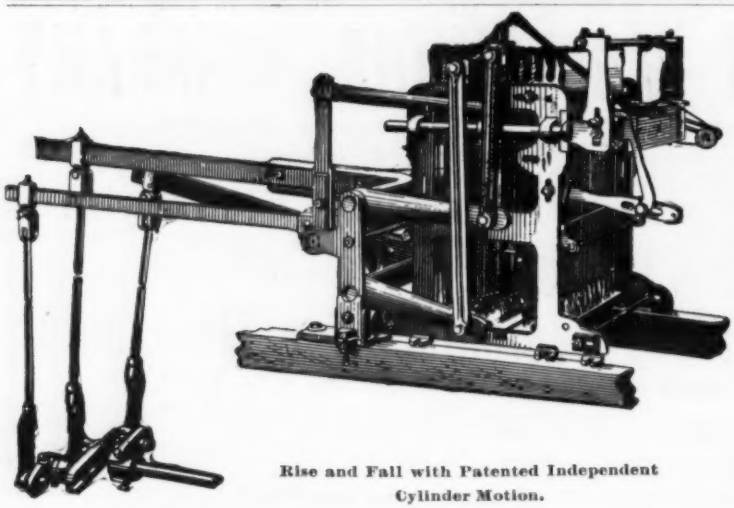

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USE THE

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"The Best Machine on the Market"

Original Fine Index Machines

Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder.

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Allegheny Avenue and C Streets,

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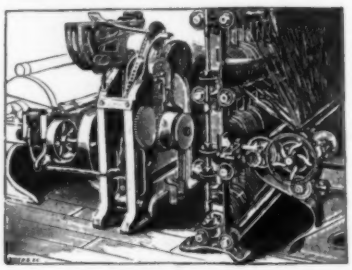

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TORRANCE PATENT **AUTOMATIC BALLING MACHINE**

With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

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CHOQUETTE WASTE SAVER. Saves card fly.

Write for particulars.

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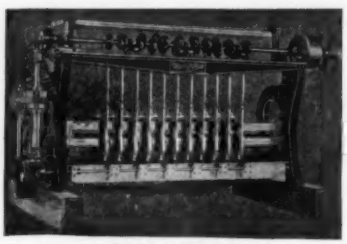
For Cotton, Woolen, Worsted, Plush Goods, Etc. Shearing Machines a Specialty.

72 Cambridge St., near Webster Sq. **WORCESTER, MASS.**



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SEWING MACHINES

FOR ALL PURPOSES WHERE A NUMBER OF ROWS OF SEAMS ARE REQUIRED

BUILT WITH ANY REQUIRED NUMBER OF NEEDLES.

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Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.

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FOR WARPERS, BEAMERS AND SLASHERS

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Mill Sewing Machines

Sew any fabric, wet or dry, thin or thick, fine stitch or coarse stitch.

Send for new circular telling how to get perfect work in this department.

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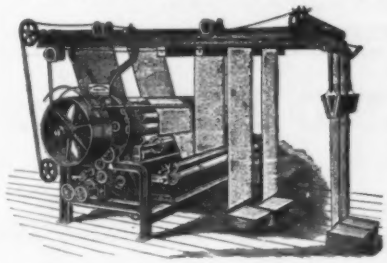
Fabric in Direct Contact with the Napping Rollers all around the Drum.

Greater Production. Better Finish. Easier Threaded. No Shifting of Filling. Better results than can be obtained with teasels.



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No heavier napping on the sides than in the centre.

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Sole Manufacturers in the United States.

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CIRCLES, HACKELS, GILLS, FALLERS and PORCUPINES.
CIRCLE KNIVES TO ANY PATTERN.

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ESTABLISHED 1834. E. A. BURNHAM, Propr.

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Yarn Printing Machines for Warp or Skein, Belt Cutters, Scarfing Machines.

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on the part of the Engineer, makes great economies in the running of a Plant, particularly if assisted by a

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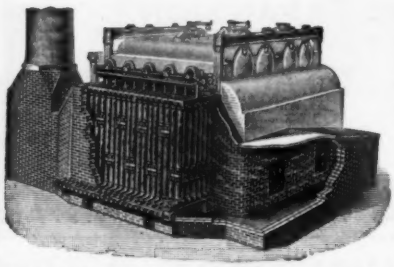

which is the greatest assistant to true economy yet produced. The gain in steam, with the corresponding reduction of fuel, seems incredible, but with our Economizer you can easily save from 10 to 20% in Fuel, and yet, through the use of waste gasses entirely, keep the feed-water heated above the boiling point. What this means to the **Textile Mill, Bleacheries** and **Dyehouses,** is best ascertained through the testimonials of those having one in their boiler room. Our booklet, sent free, shows not only how it is done, but gives you a list of users, and their testimonies as to the value to them. Our great advantage—applied without stoppage to works Write us for plans and specifications.

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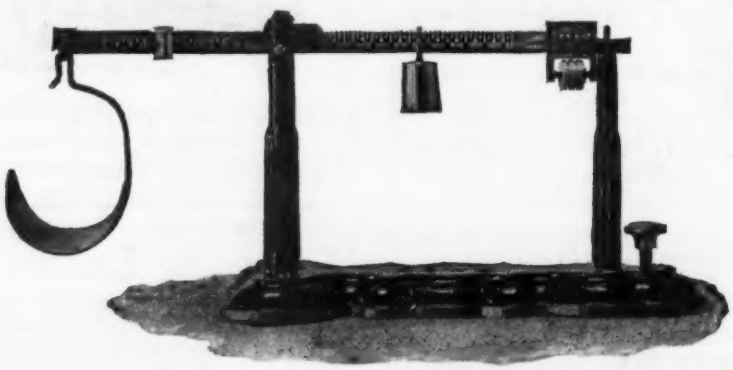
A ROVING or YARN SCALE

That will weigh by HALF GRAINS up to 1,000 GRAINS (over 2 1-4 oz.)



WITH THE WEIGHTS ALL ON THE BEAM. NO LOST WEIGHTS WITH THIS SCALE.

One of the most sensitive scales made. Positive and accurate. Send for prices.

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KNITTING MILL SUPPLIES.

☞We make scales of every description.

Are You Troubled

With the dust from your Exhaust Fan. If so, the

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Write for Leaflet No. 55-J. Tells all about them.

Heating, Drying and Exhaust Systems.
Forced and Induced Mechanical Draft.

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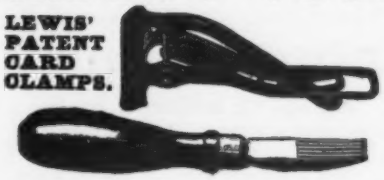
LEWIS' PATENT CARD CLAMPS.



Gardner & Reid's Card Tooth Raiser.
For Setting Up Bent Teeth of Card Clothing with a variety of all other tools used by carders and Manufacturers.
Send for circular.

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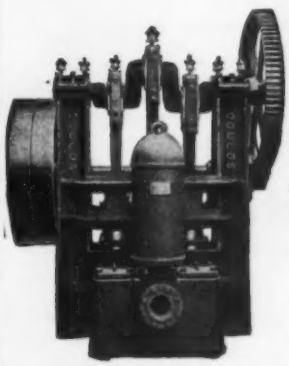
GOULDS EFFICIENT POWER PUMPS

FOR EVERY SERVICE



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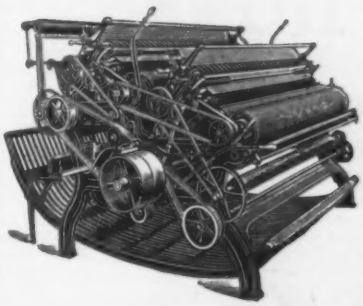

The Finest Shearing Machine in the World. Get into line. Use Double Shears. We will take your Single Shears in trade. Our representative can interest you. He will call at a word from you.

Parks & Woolson Machine Co. Springfield, Vermont.

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Mill Sewing Machines

No. 9—Portable Foot-Power Rotary Sewing Machine.

It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

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Remain on the bearings until entirely consumed, eliminating all drip and waste. Do not require heat to make them feed as do greases.

We make special grades for **TEXTILE MILL USE.** NON-FLUID OILS come out of the can **one drop at a time** instead of in a stream like fluid oils, hence are more economical and cleaner to use.

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Makers of Rag, Wool, Hair and Finishing Pickers, Automatic Square and Cone Willows, "Schofield" Intermediate Feed for Cards, Rag and Extract Dusters, Waste Pullers, Worsted and Shoddy Reels, All Kinds of Spike and Slat Aprons.

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For PLAIN and FANCY WEAVING.

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Also Hardwood Lumber.

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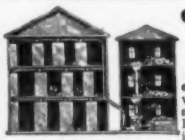

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Patentee and Sole Manufacturer of

THE PNEUMATIC CONVEYOR

For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.

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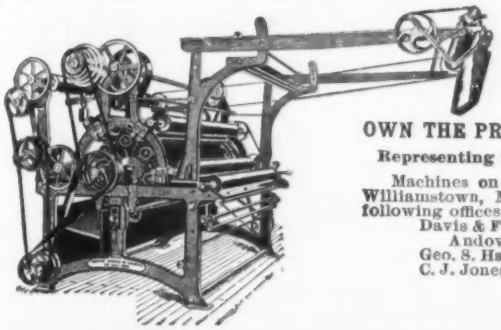

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for WOOLENS, WORSTEDS, FELTS, etc.

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We also make a machine which

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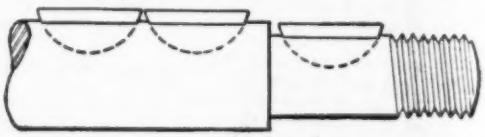

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Dixon's Patent Locking Saddles and Stirrups.

The weight can be taken off and put on to the middle rolls, without stopping your frames, when long staple cotton is used.

THE STIRRUP IS ALWAYS IN PLACE.
NO BENT STIRRUP RESTING ON ROLLS.

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Cut of No. 1

Nobody knows what to do or has anything to do with, until the doctor comes and every minute's delay counts against the injured.

THE STANDARD ACCIDENT CABINETS

Are designed for just such emergencies.

CONTENTS.

6 rolls linten bandages			2	in.	2 packages absorbent lint.
6 " " "			2 1-2	"	2 " " cotton, 1-4 lb.
3 " cotton "			1 1-2	"	1 12 oz. bottle carron oil.
3 " " "			2	"	1 12 " " arnica.
3 " " "			2 1-2	"	1 roll adhesive plaster.
3 " " "			3	"	1 package lodoform gauze.
2 packages first aid for wounds.					1 pair scissors.
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These Cabinets contain only the highest grades of medicines and bandages which are thoroughly sterilized and antiseptic. Send for Circular. Price No. 2, $10.00; No. 1, $7.00.

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Manufactured by

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Incorporated 1899.

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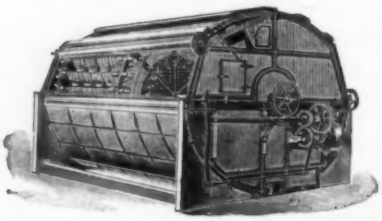

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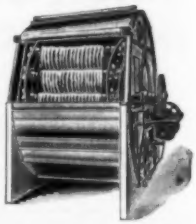
75% in Labor.
30% in Winding.
Steam and Dye Stuffs.
No Friction.
No Tangling.

CAPACITY
50 to 700 lbs per batch.



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Builders of Machines

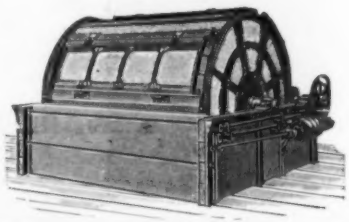
For Skein—Worsted, Slubbing, Cotton and Silk.
" " and Warp Mercerizing.
" Raw Stock Cotton, Wool, Waste and Rags.
" Garments Underwear, Hosiery and Caps
" Sulphur Colors—Raw Stock, Skein and Hosiery.

RAW WOOL AND COTTON MACHINES.

CAPACITY
200 to 1000 lbs per batch.

SAVES

50% in Labor besides Steam and Dye Stuffs. Practically indestructible. Leaves stock in perfect condition



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Eight Thousand Sets in Operation in This Country and Europe.

A partial list of manufacturers who have Evans' Friction Cone Pulleys in operation, transmitting from ONE TO FORTY HORSEPOWER:
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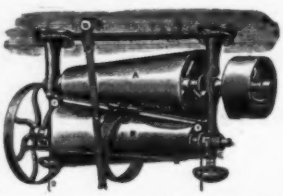
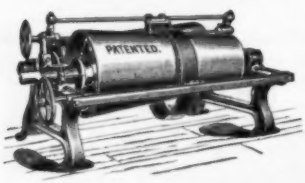
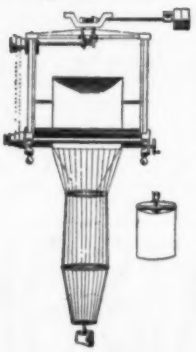




Smith & Winchester Co., So. Windham, Conn., 250 sets. Furguson & McRae, Belfast, Ireland, 25 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Saco & Pettee Machine Co., Newton, Mass., 275 sets. Pacific Mills, Lawrence, Mass., 13 sets.

Send to G. FRANK EVANS, 85 Water Street, Boston, Mass., for Illustrated Catalogue.

The Johnston Patent Improved Vertical Dryer



IS an absolute improvement over any other Dryer made. Simplicity of operation. Superiority of construction and work done. Economy of labor, hot air and room. Suitable for either extra heavy or the thinnest make of goods.

Sole Owners and Manf'rs

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KNITTING MACHINERY & ALL KIND OF MECHANICAL WORK OUR SPECIALITY.
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For Finishing Woolen, Worsted, Cotton, Knit Goods, Blankets, etc.
Greene Nappers. **French Nappers.**
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SEAMLESS MANILLA FIBRE ROVING CANS.

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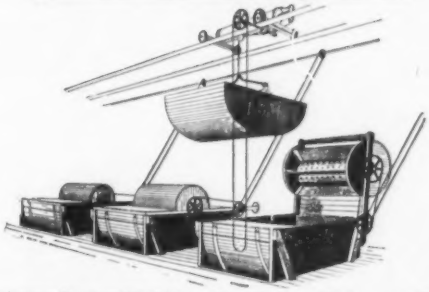
Dyeing Machinery

FOR WARPS AND PIECE GOODS

Bleaching Machines



Circulating Dyeing Machines. For Hosiery, Underwear, Raw Stock and Rags. Singeing Machines for Hosiery. Mercerizing Machines.

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BODY—Vulcanized Fibre. SIDE SEAM—Riveted with Patented Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges. BOTTOM—IXXX. Tin Star Corrugation; Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one-half pound per inch diameter. SIZE—All cans to any exact size, perfectly round and true. DURABILITY—Superior to any other can.

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The boiler of a factory corresponds to the stomach of the human system. It is effected by its feed. We prescribe for boilers free of charge. Our prescription is put up in solid, liquid or powder form. We first analyze the water without expense. Write for booklet and information.

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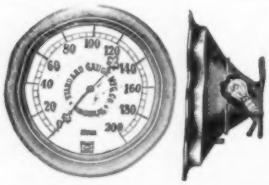

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Is particularly adapted when gauge is placed at an elevation or when light is not sufficient to show pointer distinctly on ordinary dial. There is no chance for error in properly locating position of pointer on the Illuminated Dial Gauge. A light placed in opening at back of case (generally an incandescent bulb) gives about the same effect as the illuminated tower clock at night. Manufactured by

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Made of paper and wood,
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Will not split or warp;
Not liable to break.

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BOILERS

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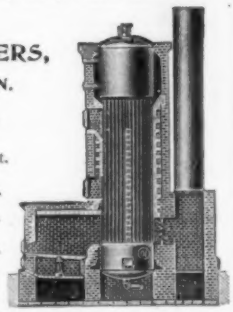

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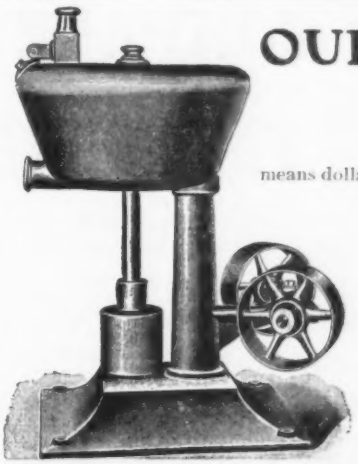

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separates oil from bolts, nuts, and scraps of all kind—oil that would otherwise be wasted, and makes it as good as it ever was, for further use. *Send for Catalogue.*

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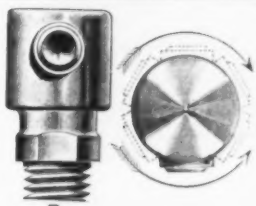

5

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TUCKER OIL CUPS

Are on THIS kind.

Send for Samples and Price List.

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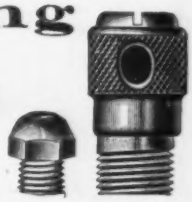
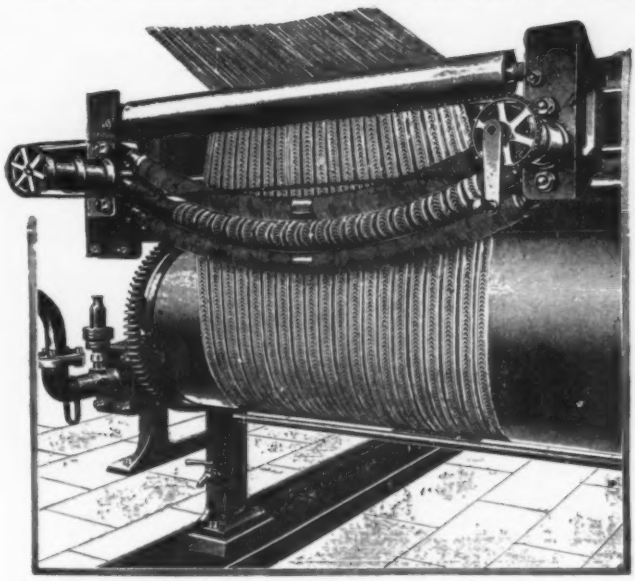


A PERFECT CLOTH EXPANDER



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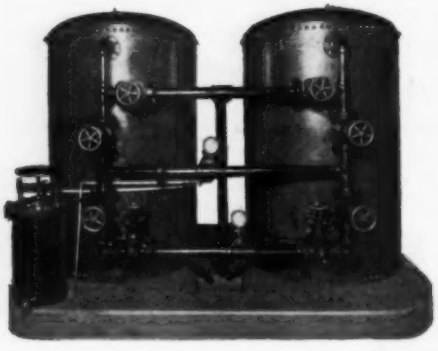

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Improved Watchman's Time Detectors

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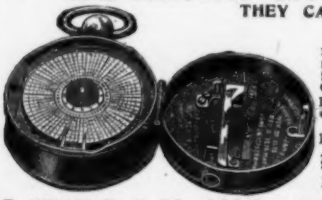

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PREVENTS BOILER SCALE

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Patented 1900-1901.

Approved by the New England Board of Fire Underwriters.

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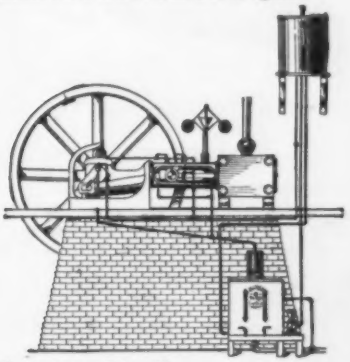
Mechanically handles the oil, keeps the engine bearings flooded with a continuous stream of *pure* lubricating oil, catches it after passing through the bearings and then thoroughly purifies it for use over and over again.



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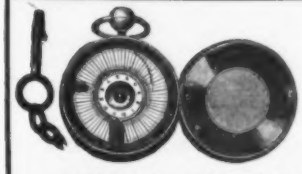

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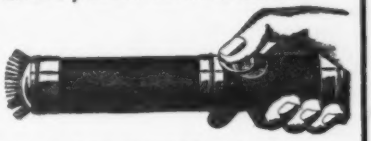

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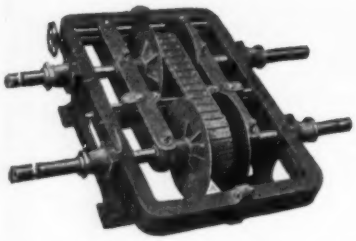

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COSTS ONE QUARTER OF OLD METHODS, LASTS THREE TIMES AS LONG. BELTS CAN BE CONNECTED OR DISCONNECTED, SHORTENED OR LENGTHENED IN A FEW SECONDS. **Booklet Explains.**

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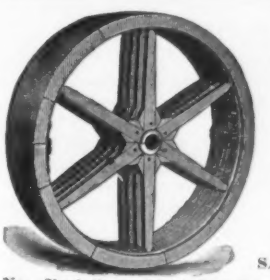

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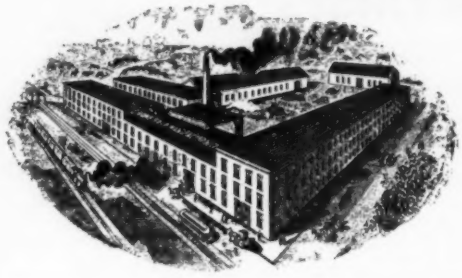

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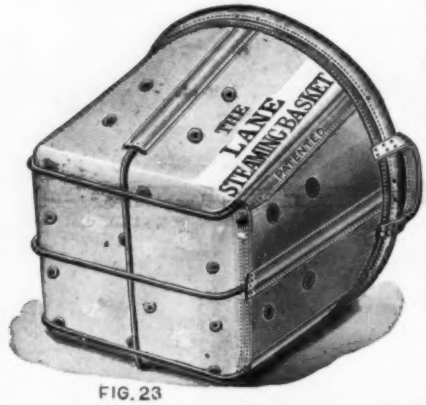

FIG. 23

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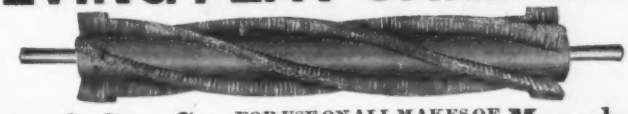

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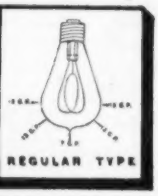

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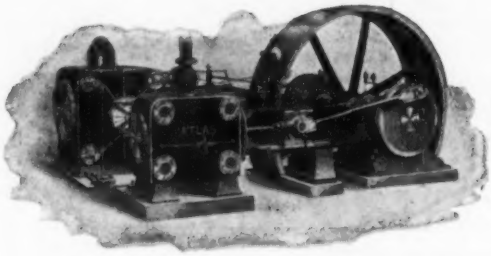

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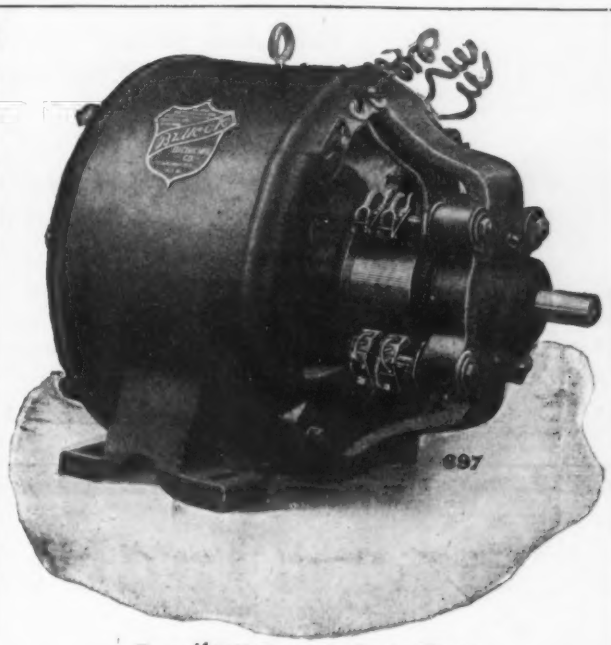

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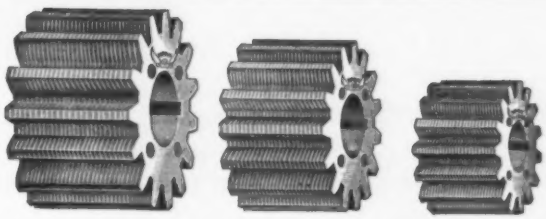

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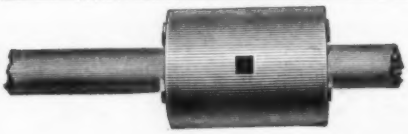

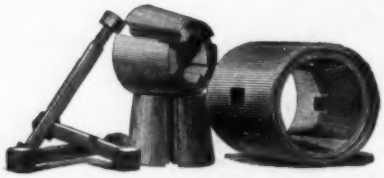

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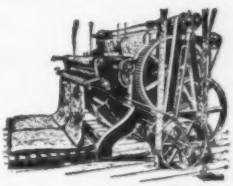

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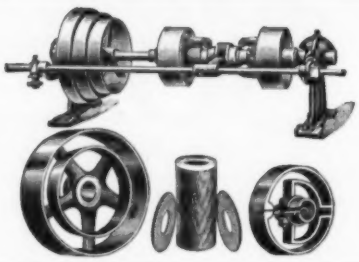

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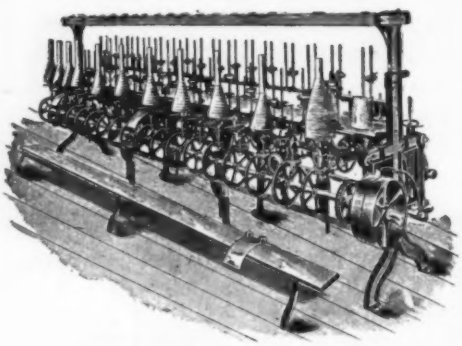

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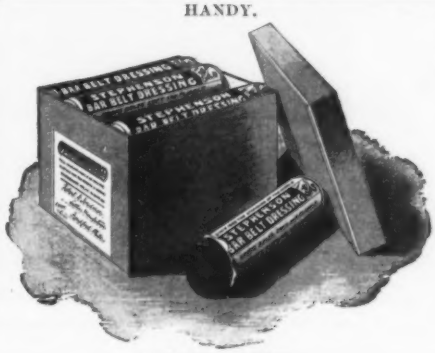

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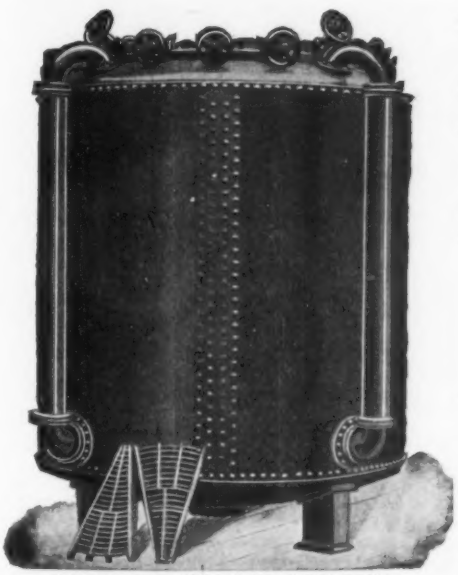

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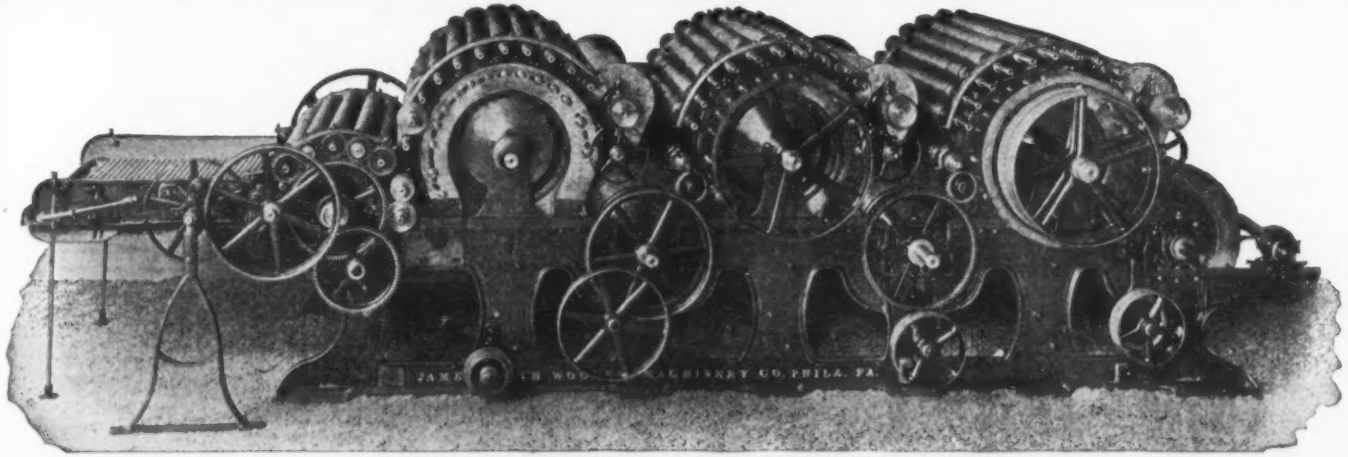

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PART I. Contains a complete directory of all the textile establishments in the United States and Canada. It tells what goods are made, the number of sets of cards, spindles, looms, whether and what they dye or finish, steam or water power, who the selling agents are, the names of the officers, superintendent and buyer.

There are 22 textile maps; gives population of town and railroad connections.

PART II. Is the Yarn Trade Index, containing classified lists of yarn spinners, arranged according to kind of yarn, size and number spun, etc. All the mills with worsted machinery are included in this section.

PART III. Contains Classified List of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers names. A list of city offices of textile mills is given.

PART V. Dealers and Brokers in raw materials and stock, including wool and shoddy dealers and brokers, cotton dealers and brokers, factors and buyers and wholesale rag dealers making a speciality of textile interests.

PART VI. Buyers Index of Textile Machinery and Supplies, and statistics showing textile machinery in the United States, giving spindles, looms, knitting machines, etc.

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is published early each year by Lord & Nagle Company. It is a complete directory of all the establishments in the United States and Canada manufacturing knit goods. It gives the location of the mill, the capital stock, names of the officers, superintendent and buyer, class of goods made, the machinery, including number of knitting machines and sewing machines, selling agents, if any, and in most cases the class of yarn bought. It also contains a list of commission houses making a specialty of knit goods, and jobbers and large retailers having knit goods department, in most cases giving the names of manager in charge of knit goods. The book is small so that it may be carried in the pocket. Price is $2.00.

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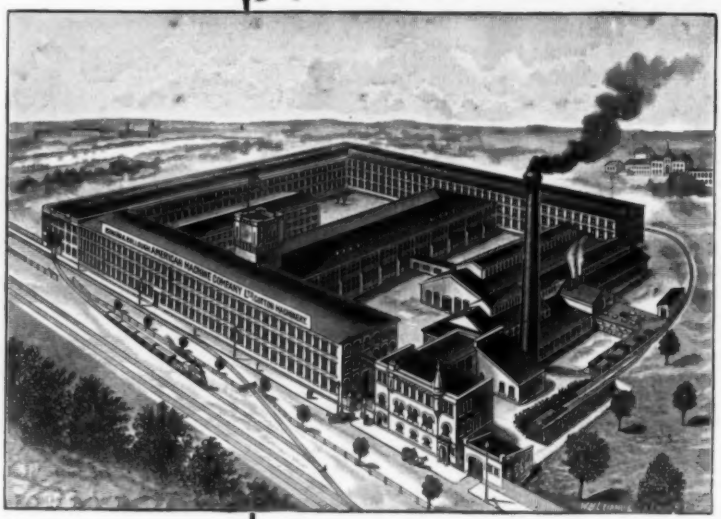

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TEXTILE WORLD RECORD

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The Textile World and Textile Record.

VOL. 26. (NEW SERIES.) MARCH, 1904 No. 6.

Monthly Comment.

The War and the Textile Industry.

The immediate effect of the war on the textile industry will be the loss of the cotton goods trade of Manchuria. With Japan in command of the sea and China occupying a neutral position no interruption in the production and transportation of raw silk from these countries, which supply over two-thirds of the silk used in the United States, is likely to occur. Notwithstanding the severity of the Manchurian climate, cotton cloth is the chief article of clothing and consequently the woolen industry will not be directly affected.

The view taken by the German cotton manufacturers is that the loss of the cotton goods trade with Manchuria is of trifling importance as compared with the scarcity of American cotton, which is threatening the very existence of the European cotton industry. If cotton cannot be obtained for the production of cloth they consider the falling-off in the demand for cotton cloth in Manchuria to be of no importance. There is much force in this line of reasoning both for European and American manufacturers. A few mills and exporters who make a specialty of supplying the Manchurian market may suffer, but taking the cotton trade in general the immediate effect of the Russo-Japanese conflict is likely to be infinitesimal.

What will be the effect of the war on the future cotton trade in Manchuria? That is another story. One should not prophesy unless one knows. We have good evidence of what was likely to become of our Manchurian cotton trade if war had not broken out. The United States is fortunate in having an intelligent and energetic consul at Niuchwang in the person of Henry B. Miller, whose reports on the raw silk industry and cotton goods trade of his consular district have been published in this magazine. Last October Mr. Miller started an investigation to determine the political and industrial conditions in Manchuria, the results being given in a report recently published by the United States government. He gives an interesting account of how the Russians were preparing to end their "temporary" occupation of Manchuria, and states that at Harbin, a place that did not appear on the maps four years ago, a vast city has grown up, and that the following are among the buildings built by the Russians for administrative purposes in the "temporary" government of this part of the Chinese Empire:

Administration buildings three stories in height, having a total floor space of 3,600 square sagene (176,400 square feet), to cost when finished	$618,000
Railway shops	1,287,500
Hospitals	322,390
Commercial school and girls' school	257,500

Technical school	128,750
Eight schools for teaching Russians Chinese and for teaching Chinese Russian	49,440
Club and store for employees	190,550
Hotel	83,945
Russo-Chinese Bank	103,000

The consul says:

Harbin was started primarily as a military centre and an administration town for the government and direction of railway affairs. Its growth into a splendid commercial and manufacturing city was not originally provided for by the promoters and it has been somewhat of a surprise to them, but the fever of making it a great Russian commercial and manufacturing city has now taken possession of the railway management and every system of promotion and protection that can be devised to increase its growth along these lines is being energetically encouraged.

Speaking of the banking facilities and the trade in cotton goods he says:

The Russo-Chinese Bank is the only banking institution in the place, and it has an elegant home in a structure of stone that has a steam-heating and electric-lighting plant of its own. The building cost 200,000 rubles ($103,000). The business of the bank has increased 30 per cent. during the past year, and its daily transactions, exclusive of railway and other government accounts, amount to 400,000 rubles ($206,000). The bank makes no loans on realty, but advances from one-third to one-half capital for current substantial business. It in inaugurating a very efficient and active system of credits to Chinese merchants purchasing Russian goods for sale in Manchuria. In some cases as much as 200,000 rubles ($103,000) have been given in letters of credit to Chinese for purchases in Russia.

These experiments are proving profitable and satisfactory. The largest success is reported in cotton goods. Many large orders are now being placed in this line and a substantial trade is being created. These goods are brought into Manchuria via Vladivostock free of duty. So far, sugar has been the only article purchased on which the Chinese have lost money.

This system of advancing credit to Chinese merchants for the purchase of Russian goods prevails now generally throughout Manchuria, and it is by this method and by imports free of duty and favored rates over the railway that Russian cotton goods are likely to capture the great trade of Manchuria that is now largely in the hands of American manufacturers.

In cotton goods, Russia is anxious for the trade and is making every effort to secure the business and is becoming a serious competitor. Her advantages in this line are political, bank advances, and transportation. In a free contest, on purely economic lines, I think the United States can hold it. Russia favors the export of cotton goods into Persia by a heavy bounty, and just what she will do in order to secure this trade in Manchuria is not yet determined. At present she is providing a heavily subsidized steamship line to bring these goods to Dalny and Vladivostock, where they enter free of duty, and no doubt they receive preferential railroad rates from these into the interior, or will if necessary.

These things, together with the financial help of the Russo-Chinese Bank, have not yet been sufficient to do more than start the trade well, and they may have to resort to a bounty in addition, unless they can shut out foreign goods by a tariff.

The production of cotton goods in Russia is growing very fast, and as they have their designs on securing the trade of Manchuria in this line it is only reasonable to suppose that they will eventually secure the trade they are prepared to handle in any country over which they have control.

Mr. Miller thus sums up the situation:

A study of conditions in Vladivostock, Harbin, and other districts is not particularly encouraging to the idea of extension of American trade in Manchuria in any line that Russia is prepared to supply. A knowledge of the earnest intention of the Russo-Chinese Bank to press the sale of Russian goods, a slight insight into the methods and determination of Russian railways to find a market for the products of Russia, and the interest displayed in developing resources along their lines for Russians and Chinese only, taken in connection with the natural wealth and resources of the country, do not favor the hope that under a Russian regime our trade in Manchuria will be as large as it was before.

If we take into further consideration the fact that the Russian Government—by subsidies and bounties and through its banks and railways—is engaging in industrial and commercial pursuits as a Government, and calculate the cheap food, cheap and reliable labor, and vast mineral resources that she will have at her command on the Pacific, the question of the Manchurian market becomes comparatively insignificant and we find ourselves face to face with the greater problem of the markets of all Asia.

With millions of cheap and efficient Chinese laborers, with vast coal fields bordering on the Pacific, with mountains of iron and copper, vast forests, and enormous areas of agricultural land—producing now the cheapest food in the world—what is to prevent Russia, if her apparent plans are real-

ized, from becoming a dominating factor in the commercial development of the Far East? One can not view the marvelous growth of a city like Harbin or observe the cities of Vladivostock, Dalny, and Port Arthur and the great Siberian Railway without pondering seriously the meaning of it all in the future of Russia on the Pacific.

This report, from which we have made extracts, was written long before the outbreak of the war and is accompanied by photographs of the immense government buildings in course of erection by the Russians at Harbin. The report and the pictures compel the conviction that the Russians intended to make Manchuria a part of their vast empire. That meant the total loss of the Manchurian market as far as America is concerned. The success of that plan is now threatened by Japan, who pledges herself to the maintenance of the open door.

The Men's Wear Trade.

Business in heavy weight goods for men's wear has been disappointing to manufacturers. Buyers have placed small orders and the mills have nearly all found it difficult or impossible to secure business to keep the machinery in operation. The reduction of prices below last year's values by the leading manufacturers established the standard to which the rest of the trade has been forced to conform. This action, however, has not resulted in the desired sales. The dullness is not caused by high prices as is the case to a great extent with cotton goods, but simply to the general disposition on the part of clothiers to await developments. The practice of making men's wear goods on order only is so general and firmly established that present conditions are immediately reflected in the mills in the form of idle looms that await the orders of the consumer. That is a healthy state of trade. If goods are not wanted they are not made. The raw material remains in its original state until the manufacturer knows that he can find a sale for it if converted into a certain style of goods. The clothing trade has lost the former power to demoralize the market and push prices down by simply refusing to buy.

While the business in men's wear so far this season is disappointing, the orders are giving employment to a large part of the machinery. The general business of the country is on a sound basis, and there is no prospect of any serious reverses to the general prosperity. We have only to look abroad and contrast the conditions there with our own to realize our own fortunate position. In Europe textile manufacturers are involved in a veritable sea of troubles; war, tariff agitation, cheap markets, poorly paid labor, fierce competition and high priced raw material, much of which must be bought in the United States. Here we have peace, a settled tariff policy, the best market on earth, well paid labor, healthy competition and raw material at a fair price. We have no reason for despondency. Let us be happy despite the fact that clothiers deem it prudent now to restrict their purchases of men's wear goods.

The Origin of the Cotton Thread Industry.

An interesting account of the origin of the cotton thread industry will be found in another part of this issue. It is written by ex-Provost James Clark of Paisley, Scotland, who is a direct descendant of the founder of the industry and likewise an expert in that line, having been actively connected with the cotton thread trade from his boyhood. Mr. Clark recently presided at a political meeting at Paisley, called to support the protectionist policy of Mr. Chamberlain, and in his opening address referred to the humble beginnings of the thread industry. At our request he now tells the interesting story to our readers. It confirms in a striking manner the wisdom of the old adage: Despise not the day of small things. The necessities of a widowed mother one hundred and fifty years ago forced her to leave the old farm and take her children to Paisley to gain a livelihood. Result: Paisley is today the center of the world's cotton thread industry and branches of the Paisley thread works are found in America and on the Continent of Europe.

The political discussion which brought out Mr. Clark's story is both interesting and familiar to Americans. It is but a few years ago that we were engaged in a discussion of

the same issue, protection versus free trade. Fortunately for us the contest has been transferred to the other side of the Atlantic and our friends there are trying to answer the question, Who pays the tariff tax? One side claims the foreigner pays it, while the other side is equally positive that the home consumer pays it. The same old issues, the same old arguments, the same old fallacies that confused us twelve years ago are now distracting the people of Great Britain.

It is a matter of congratulation that the tariff issue has been settled here and a stable policy established enabling us to carry on business free from the demoralization that accompanies uncertainty as to tariff rates. In his address at Paisley Mr. Clark referred to the unexampled natural advantages of the United States, advantages that we are apt to forget, but of which the inhabitants in less favored lands do not lose sight:

I say she (the United States) enjoys these blessings (of free trade) now. (Hear, hear.) She is free to manufacture her own goods and sell them in her numerous States, unburdened by tariff taxation. She is free from the competition of foreign nations, and she is free to inundate our markets with her manufactures without cost to her, while we are fettered and circumscribed by her prohibition duties to our small islands, and yet it is said that America does not enjoy the blessings of Free Trade. America has all the market of 80,000,000 people to herself. She possesses all the raw material within her borders that her manufacturers require, hence she needs to import none. She grows cotton, tobacco, Indian corn, wheat, oats, and fruit in abundance. She possesses iron, gold, and silver mines, vast coal fields, inexhaustible timber forests, incalculable water power in her mighty rivers, and swine, sheep, and cattle by the tens of millions. What else, I ask, could she have to make her more blessed than she is? (Cheers.) And still it is suggested that she does not enjoy the blessings of Free Trade. I, for one, don't believe it, and I hope you are all of the same mind, as I think I have made it clear that she possesses the "blessings" of Free Trade up to the very hilt. (Cheers.)

Nature has made America the garden spot of the world, and enabled us to enjoy the great advantages of free trade and at the same time protect ourselves from the evils that would accompany a free exchange of products with less favored lands.

Changes in the Cuban Tariff.

As soon as the reciprocity treaty with Cuba was ratified by the Senate the Cuban government took measures to increase the duty on imports to that country. Pursuant to an act of the Cuban Congress, President Palma issued a proclamation on February 1st, ordering certain increases in the Cuban tariff rates to go into effect on Feb. 5, 1904. The changes are numerous and affect all except thirty or thirty-five paragraphs of the old tariff. The increase varies from 15 to 30 per cent.

This action on the part of the Cuban government has been widely misunderstood in this country and denounced in some quarters as a breach of good faith and a practical abolition of any advantages that might accrue to this country from the reciprocity treaty between Cuba and the United States. Upon examination of the facts, however, this view of the case seems to be wholly unfounded. The Cuban finances are by no means in a flourishing condition and the Cuban government found it difficult to make both ends meet previous to the ratification of the reciprocity treaty. That treaty promised to reduce the Cuban income by two or three million dollars and it was imperatively necessary to make up this deficiency from some quarter. The only practical means of doing this seemed to be by an increase of the tariff rates. If such a change had been confined to American products, such as food stuffs, on which there was no competition with the United States by foreign countries, it would plainly have been a discrimination against this country. This, however, has not been the case. The increase has been general and applies to products in which foreign countries are competing with the United States.

As the interest of our readers is centered chiefly in textile goods we will take from the textile schedule an illustration of how the changes are to work. In another part of this issue we compare an English cotton print exported to Cuba, with an American print. The English fabric has 63 warp and 58 filling threads per inch. It measures 6.3 square yards per pound. This cloth is therefore classed under Sect. 115b of the Cuban tariff,

which provides for cotton tissues having 7 1/2 to 11 1/2 threads per 1/4 inch, a duty of 9 1/10 cents per pound, with a surtax of 40 per cent. on printed cloths. The English print was sold at Manchester for 3 1/4 cents per yard, 25 inches wide. As there are 9.08 yards 25 inches wide per pound the value in Manchester of these goods is 29 1/2 cents per pound. The duty per pound on this English cloth before and after the change of the Cuban tariff are as follows:

	Before the Change.		After the Change.
Specific . . .	.091		.109
40 per cent . . .	.118		.142
Total, 70.8 % .	.209	85%	.251

The reciprocity treaty provides for a reduction of 30 per cent. on goods from this country classified under Sect. 115. Under the old Cuban tariff this reduction would have made the duty on the fabric under consideration .146 per pound or 49.6 per cent., giving the American manufacturer an advantage over his foreign competitor of 6.3 cents per pound or 21.2 per cent. of the total value. With the rates increased 20 per cent. as provided by the recent decree of President Palma, the reduction of 30 per cent. provided by the reciprocity treaty leaves the tariff on this fabric .176 per pound or 39 1/2 per cent. if imported from the United States. As compared with his foreign competitor the American manufacturer is favored with a reduction of .075 per pound or 25 1/2 per cent.

It is thus seen that the higher the Cuban rates on cotton goods the greater will be the advantage to the American manufacturer from the 30 per cent. reduction of rates provided for by the reciprocity treaty.

As the Cuban tariff is for revenue only, there being no prospect of the manufacture of cotton goods being established in Cuba, the differential on cotton goods in favor of American manufacturers will be increased in direct proportion to any increase in the Cuban tariff. Instead, therefore, of the change in the Cuban tariff being considered a breach of good faith it should be looked upon as a perfectly legitimate action on the part of the young republic. It shows commendable wisdom on the part of those in charge of the Cuban finances and incidentally increases the advantages offered to American manufacturers by the reciprocity treaty.

TEXTILE CONDITIONS IN ENGLAND.

(Specially written for The Textile World Record.)

Not a great deal of progress can be noted as the result of the past week's work, business being rather difficult to do at satisfactory prices. Wool values remain firm for every quality of stock, and that is about all that can be said. There is no great weight of material being offered. The absence of stock is a marked feature of the home wool market, and nobody yet seems prepared to sell for any less money. Some seem to think that in one or two qualities the tendency of prices is to harden, but at present it is impossible to quote either merinos or crossbreds any higher than what they were. About 24 1/2d may be considered as the price of a super 60's top, this being made by one or two standard topmakers, though 24d will buy a very respectable combing. The weakest part of merinos continues to be the large number of idle spinning frames, and here the outlook is not considered to be of that rosy character which men would like to see. I know no other single factor which is keeping merino wool steady than the absence of heavy stocks, though some contend strongly that the diminished consumption fully offsets the lessened supply.

The fine worsted end of the trade is slack and this is reflected especially in spinning and weaving branches. Commission woolcombers are a little better employed, due chiefly to the fact that direct imports are arriving and topmakers are getting ready for the first move. Early Australian purchases are by no means satisfactory, and importers would regard a rise in the price of Botany tops as a veritable god-send.

Crossbreds continue to hold the field, and there seems at present to be a big tug of war over the price of both 40's tops and yarns. Things seem to have almost come to a deadlock, and it remains to be seen which party is going to give way, either spinner or yarn shipper, and if the former will stand his ground he will win. Repeated attempts are

made between German yarn exporters and crossbred spinners to fix up contracts, but so far they have been in vain, the latter refusing to budge even a cent per pound when they know that they cannot replace their stocks at less money. In some cases as much as three cents per pound is the difference between a spinner's quotation and what exporters offer, and because of that things are practically at a standstill. There is not much new business offering, most frames being kept going on old contracts.

MANUFACTURERS QUIET.

Speaking generally, Bradford manufacturers are quiet, especially those producing dress goods. The spring season is here, and apart from wholesale houses having made their spring deliveries, which are decidedly below average in point of quantity, dress goods manufacturers are anywhere between the devil and the deep sea. I don't remember a time when the outlook was so black from Bradford's standpoint as it is today, for what with French dress goods selling so extensively, the purchasing power of the people so reduced, and the cotton crisis, the outlook is far from encouraging for Bradford's staple trade. If there had been anything like a normal supply of wool, we should have had prices down cents per pound, and it is only the pronounced bareness of stocks that is keeping values fairly steady. Makers of worsted coatings are very slack, and serges are far from being a prosperous commodity. You can buy today worsted serges anywhere from 60 cents upwards, 6-4, and by way of showing American manufacturers what the usual "clay coatings" are selling at today, the following list will be interesting:

WORSTED COATING PRICES.

Width. Inches.	Weight. Ounces.	Cents.
56	22	86 to 88
56	20	80 to 82
56	18	72 to 74
56	16	68 to 70
56	14	60 to 62
56	12	54 to 56

The above prices are for blacks only, and for blues 4 cents more per yard should be reckoned.

WOOLEN TRADE.

Woolen manufacturers are, if anything, in a fair way for business, but there is nothing whatever to shout over. It is taking most manufacturers all their time to keep their mills going ordinary hours, and overtime is the exception even in the Colne valley. Spring patterns show not a great difference from last season, and the greatest call seems to be for goods low in price and more or less fancy. Flannel stripes seem to bid fair to be fashionable again this coming season, and nearly all in dark greys.

COTTON AND SHORT TIME MOVEMENT.

A sigh of relief has been felt over the break in cotton prices, but as I write this there are few Lancashire spinners who yet believe that they are out of the wood. There can be a fresh "bull" movement on old crop before many weeks have passed, and Lancashire spinners do not yet feel disposed to relinquish a policy which is bound to be more or less effective in bringing down cotton prices. A few days ago the general committee of the Lancashire Cotton Spinners' Federation were engaged in further considering the desirability of imposing a penalty on all firms in the federation who are working full time. According to the rules of the federation, before the penalty clause can be put into operation a mass meeting of the members must be held, but the committee consider there is no necessity to call such a gathering, and, further, that as short time is a united trade movement it would be unfair to penalize members while there is no power to inflict a similar penalty on those outside the federation.

A report on the extent of the short time movement shows that 88 per cent. of the members using American cotton are running forty hours per week.

The number of firms outside the federation signifying their adoption of curtailment of production is also increasing, and mention was also made of the decision of the associations of France to run shorter hours.

Seasonable Fabrics.

MEN'S WEAR WOOLENS.

During the past month many buyers have visited the market, but the volume of business booked is not up to expectations; very few of the agents report business as satisfactory, although the lines exhibited comprise a wide variety of styles with prices at a lower level than last year. The development of heavy weight goods is backward and instances of lines sold up and samples withdrawn are few. The demand for mercerized worsteds has been prominent. The excellent style of the fabrics in fancy woolens is a marked feature of the market and relatively speaking, worsteds are not in as strong a position as woolens. Fancy woolens in all grades, especially in medium quality, have been the best sellers.

Worsted goods from $1.25 to $1.85 bear the strongest competition. Fancy overcoatings of the Bannockburn order are well thought of and are considered the leaders among heavy weights, although there is a marked tendency towards black.

Cassimeres are not selling as freely as they were a year ago, and up to the present the demand for trouserings has been indifferent, although in a few instances orders have been booked in a gratifying manner.

Duplicate orders on light weight goods are coming in more freely than expectations warranted, and the business with the clothiers has been of considerable proportion. Reorders on rain cloths have been most satisfactory. Early in the season it was predicted that browns would predominate, but the development has not been along this line, buyers being just as insistent for grays as ever, while the darker shades in modest effects seem to be given the preference.

Early in the month the American Woolen Co. opened the National and Providence mercerized worsted goods at the following prices: 97 1/2c., $1.05, $1.07 1/2, $1.10, $1.12 1/2, $1.20, $1.25, $1.27 1/2, $1.30, $1.40 and $1.50.

Wendell, Fay & Co. have opened the Middlesex cheviot at $1.15 and $1.22 1/2.

The Coronet Worsted Co. has opened its complete lines of fancy worsted and Mr. H. E. Peabody, the New York agent, states that orders are coming in very satisfactory, with several of their lines well sold up.

Ethan Allen has opened his cheviot suiting at $1.25 and $1.37 1/2; Saxony finished wool goods at $1.15 to $1.37 1/2; worsted and wool cheviots from $1.50 to $2.25. The line of rain coats for next fall are shown in a large number of attractive mixtures and plaids and the demand for goods of this character is still considered strong.

DRESS GOODS.

The dress goods division may be regarded as moderately satisfactory. There is a considerable number of buyers now operating. Large purchases, however, are the exception. Prices on the whole are well maintained and the prediction is made that monotones will be leaders for the coming fall season. Broadcloths and zibelines of the short sheared variety are the two classes of goods that have begun to show strength. Such goods as venetians and cheviots are considered staple and the demand for them has been liberal. For immediate delivery voiles, both plain and nub effects, are unquestionably the leaders and the vogue of this material has been phenomenal; silk warped fabrics such as eoliennes and silk and wool poplins are in a strong position. In certain sections of the country there is still a request for Scotch mixtures and mannish tweeds. The medium trade are adhering to this class of fabrics with a tenacity that indicates another season of spring popularity. Cloths showing unobtrusive stripes have come in for a liberal percentage of business, and the interest taken in mohairs is still unabated with an increasing demand for the neat hair-line checks and stripes and nub effects.

It is feared by several importers that a shortage in creams will soon ensue. Deliveries on present purchases cannot be made within a month or six weeks. Creams are slower of production than any of the darker shades because of the difficulty in producing perfect goods free from spots and flecks.

Metallic printed mohair on the order of Fig. 1, sold by Frederick Butterfield & Co., at 37 1/2c., is one of the most staple lines in dress goods that can be shown by any retailer. Fig. 2 shows an irregular stripe suiting for fall wear made by the Botany Worsted Mills.

FIG. 1.

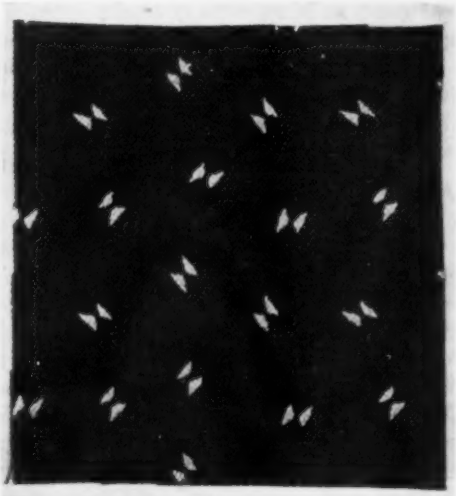


FIG. 2.

The most prominent colors that will be worn during the coming season in sheer wool fabrics will be grays, tans, china blues, mauves and reseda. Indications are that browns will not be as popular during the spring and summer as they have been during the past fall.

FIG. 3.

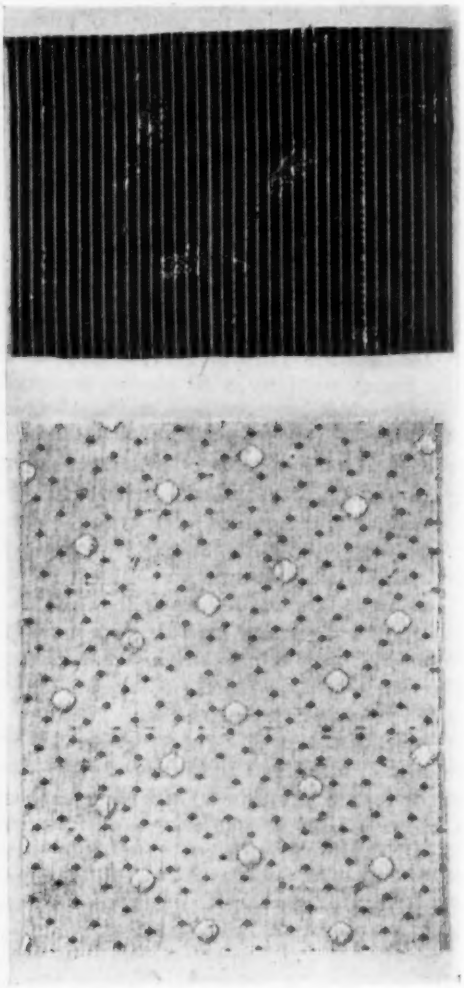


FIG. 4.

Champagne has lost none of its prestige; on the contrary, it is as conspicuous in all dress goods lines as ever, and white promises to be equally as good as last year.

SILKS.

The market for piece silks is slowly improving, but there are few concerns able to report satisfactory business. A reaction from

the late depression is, however, gradually taking place, and the outlook is distinctly of an encouraging nature. The waist trade promises to prove satisfactory and silks for that purpose are receiving considerable attention. Small checks in black and white and other colors, hairline stripes with jacquard raised flower effects similar to Figs. 3 and 4, shown by Valentine & Bentley, are used extensively for waist and suit purposes. The revival of printed warps and other large fancy designs did not prove successful, with the result that few such lines are shown today by the manufacturers.

Peau de cygne, peau de soie and taffeta are the most prominent in the order named. Bayadere stripes are meeting with a limited request, but their position is by no means strong. The new weave called messalines is popular with houses catering to the exclusive trade. The fall popularity of crepe de chine promises to be duplicated in the spring. Foulards show considerable strength; the range shown comprises a beautiful collection and all indications point to their continued popularity for spring and summer wear. Some of the designs deserve special mention, such as the faconne effect in the ground interspersed with mother-of-pearl designs.

The demand for Japanese silks both in white as well as shantungs is up to the most optimistic predictions; large quantities are being bought by the waist manufacturers. Rough finished shantungs are being freely bought for the high class trade, rather than those of the smoother finish.

WASH GOODS.

The interest manifested in cotton dress goods is eminently satisfactory both to manufacturer and jobber and the present season promises to be the best for a number of years; not only are the individual purchases larger than formerly, but they also embrace higher priced goods than the buyer has hitherto been in the habit of taking. The manufacturers have anticipated this demand by producing tempting styles and designs. Among the fabrics which have made strides into popular favor during the past month, printed organdies may be mentioned as being the most prominent and dress linens in a wide variety of styles and patterns are meeting with splendid support. Champagne and pongee will prevail to a marked extent and the coarse canvas weave effects are spoken of as being very desirable.

The Arnold Print Works are offering some very beautiful styles of Swiss broderie, two of which are shown at Figs. 5 and 6. The undulating stripe in Fig. 5 is embroidered

FIG. 5.

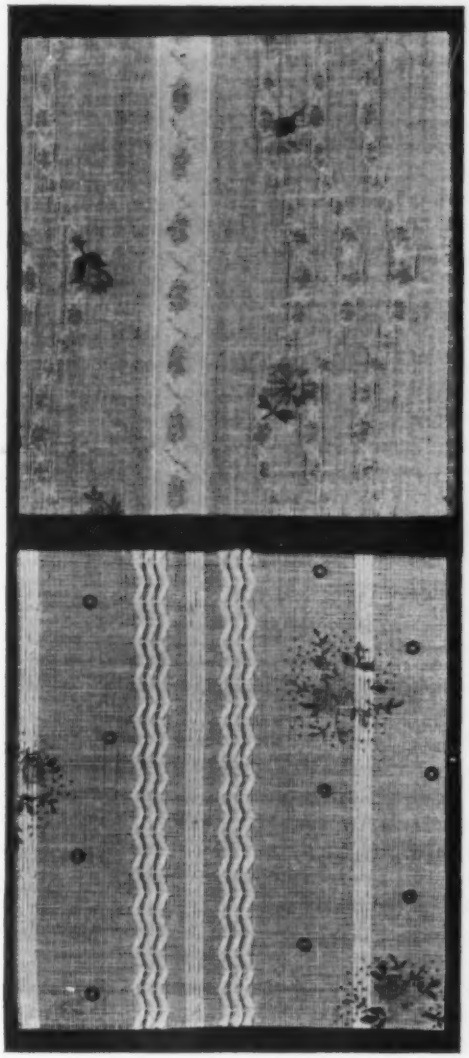


FIG. 6.

with mercerized cotton. The contrast with the ground work combined with the printed design makes a very attractive fabric.

White Goods: Sheer goods such as Persian lawns and Swiss muslins, both plain and dotted, are in good request and while there is no scarcity at the present time, it is the general belief that before the season is over, it will be a difficult matter to secure a number of desirable lines.

Mercerized vestings of the better grades are still selling fairly well, while the heavy and low grade goods are hard to move.

Prints: While the market appears unchanged the outlook for the immediate future is not encouraging for large purchasers. Present buying is limited to actual needs and fancies are quoted at 6c. and 6 1/4c.

LININGS.

The demand for cotton linings is only moderate, buyers placing their orders in the most conservative manner, quotations are well maintained and few concessions are to be met with. The demand for sleeve linings from the clothiers has been of considerable volume for immediate delivery; mercerized lines are in fair request, but mohairs, alpacas and serges are reported as being very dull. Kid finished cambrics remain at 4 1/2c. Silk linings are moving more freely than for several months past.

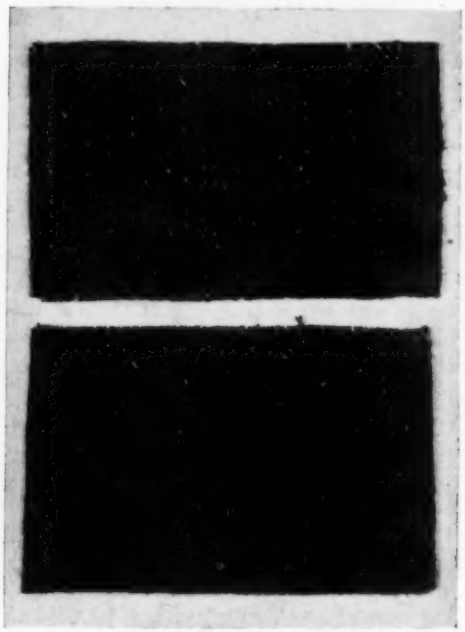
ENGLISH RAINPROOF COVERTS.

BY S. B. H.

There is no cloth of modern times constructed that has had such an extensive sale in England as rainproof coverts, and those manufacturers who have produced them have enjoyed a trade of no mean order. I could put my hand upon a dozen manufacturers beginning at Leeds and right away to Huddersfield whose position has been coveted by scores of others, and all because of their running their mills overtime and some all night. They have produced and been able to sell as fast as produced all their products in rainproofs, and for next winter this same class of goods is already destined to occupy a front rank position. Coverts can be bought today at all prices, 48c., 6-4, being a popular price. I want to show a line of rainproof tweeds at 48c., the smartness of which at the price cannot be disputed.

COTTON TWISTS.

The leading part in this line of cloth is played by the cotton twist. The popular



ENGLISH RAINPROOF COVERTS.

shades are dark greys. Black and white twists and black warps form the leading parts of the cloth. They all show herringbone stripe effect, and cloths are very smart indeed at the price. Of course, the shades vary, some being lighter than others, according to the "twine" of the twist, and the thickness of the white used in twisting. The tendency for next winter fabrics is for the stripe to become more pronounced, and in obtaining this to introduce a different weave or else some louder threads. Both courses are adopted, and one of the cloths which accompanies shows this distinctive feature. Then again the feeling is also to introduce coarser materials, and to produce rainproofs showing a rather coarser quality, and which I have no doubt will sell next season. I do

not think that American manufacturers need fear about the continuance of these cloths for another season or two, for the popular taste and feeling is still very pronounced here in England. The finish of the fabrics has a good deal to do with the sale of them, and they should be given a nice, soft, clothy handle. The goods should also be cut fairly close, so as to bring out the herring-bone effect.

A VARIETY OF YARNS.

It is a very common occurrence now-a-days with English designers to introduce yarns of a totally different class and color to give life and piquancy to the whole cloth. In Leeds the other day I saw a covert, the stripe of which had been entirely formed by the introduction of half a dozen threads of an altogether different character, and the effect was marvelous. In one of the patterns under consideration there was an arrangement of two ends black cotton, two ends black and white twist, two ends black cotton, and two ends lavender and black cotton, and it gives a fairly pleasing effect to the eye. The lay-out on the cloth which helps to form a distinct stripe is as follows: Four ends black, four ends twist, four ends black, then two twist, two black for twenty-four to thirty ends, and when this is woven with a herring-bone weave, it gives a very pleasing effect.

I am able below to give readers full particulars of what is being done by one of our leading manufacturers of a rainproof, at least what he does in making a standard cloth. This cloth is sold by him at 72c. per yard, 18 ounces, 6-4, and his manufacturing particulars are as follows: He twists togethers 40's black and 40's white worsted, there being 3,800 ends in the warp, 66 yards long, 15 dents per inch, sleyed four ends in dent, 53 picks per inch, of three run weft.

The production of the weft is an important matter. In the cotton covert already referred to the weft is made entirely of black mungo and black cotton; the blend is as follows: forty per cent. of black Peru cotton, 40 per cent. of black worsted mungo, and 20 per cent. of fine crossbred wool or noils, wool preferred.

This is rather better than the average blend, and one of our local manufacturers who is producing one of the most popular coverts on the market at 60c. per yard, 18 ounces, spins some of his weft up to 3 1/2 runs without a single pound of wool in the blend, his weft being made of about half cotton and half mungo. This may surprise American readers. The twist is composed of one thread white Botany worsted and the other woolen, and it is indeed a marvel of cheapness.

ENGLISH TEXTILE SCHOOLS.

A REPLY TO YANKEE.

Editor Textile World Record:

The letter signed "Yankee" in the February issue of the Textile World Record appears to me to convey a somewhat erroneous impression regarding the students' work at the Yorkshire College, Leeds, England.

He says: "With few exceptions all the fabrics woven on the power looms are constructed in the designing department." From the next sentence a reader might infer that the term "designing department" mentioned above meant the instructors.

It is now nearly seven years since I left Yorkshire College, where I went to learn designing, weaving, and cloth finishing, and the system may have been changed since that time. While a student there I was encouraged to make my own designs for power looms that I worked on, as were all second and third year students. The first year class worked principally on the hand looms.

Regarding "students being allowed to design some of the ranges:" By "ranges" I suppose he means "blankets," i. e., cloths where the same style is shown in varying color schemes in one width of the same piece.

At Yorkshire College the advanced students were required to make their own ranges for the hand looms, which gave them practice in making and drawing in warps as well as arranging the colors to suit themselves.

The power loom warps were obtained from the mills as the school did not have a dressing frame. Students were allowed to tie ends of various colors in the power loom warps, if

they desired to do so, as well as to try their own chains.

Each student in the class was supposed to get a sample swatch for his pattern book, of all cloths woven on the power and large hand looms, with design and construction particulars, so that if a student made a design of his own for a warp in a power loom he would have to weave a swatch long enough to furnish a small sample to each student in the class.

All the ranges of samples woven by the students on the hand looms became their own private property; they did not have to weave a sample for the school, as in Massachusetts schools, except in a few instances.

A custom of the college when I was there was for each advanced student to make a piece of cloth and have it made into a garment so that he could wear it and keep it as a souvenir. The cost of the yarn used was paid for by him. Some of the students made designs to be woven with warps that were then in the power looms, but others had warps made specially.

The souvenir suit or vest business was a good one for the student, as it was necessary that he should see it, and work it, from beginning to end, taking it through all the processes of designing, weaving and finishing. A mistake on his part meant a lesson that he would not readily forget.

I saw one student take a fancy vesting cloth through the necessary processes and spoil it in the finishing room by setting the shear blade too close, thereby cutting some of the silk spots enough to ruin the piece.

JOHN BULL.

AN UNABRIDGED DICTIONARY OF WEAVES.

Every weaver and textile designer, compelled as he is to make slowly and laboriously a record of the weaves obtained from his own experience or to rely upon the imperfect compilations that have been published, has felt the need of a comprehensive collection to which he could refer and use as a guide. This want has at last been supplied by Franz Donat, Professor of Weaving at Reichenberg, Austria, and his work has recently been published with the reading matter in English, French and German. The book contains 9,015 designs on 300 colored lithograph plates (10 in. by 15 in.), systematically arranged to illustrate the foundation and derivative weaves. It has not been the author's object to include every possible combination in this book, as that is a manifest impossibility. He has aimed rather to make the collection so complete that the designer may find in it weaves illustrating the methods by which every weave is constructed.

The author has been engaged for ten years in the preparation of this elaborate work and states its objects as follows:

1. To introduce new ideas into the designing of textile fabrics, and to render it possible that with one and the same loom mechanism a wide range of different patterns can be woven.

2. To illustrate in some measure the infinite variety of styles that exists in the designing of textile fabrics.

3. To give the systematic development of designs as wide a range as possible.

4. To supply a reference book for the designer.

Owing to the high cost of such a work the text is printed in English, French and German in order to make it suitable for the wants of practically the whole textile world. This plan makes it possible to sell the book, well bound, at the comparatively low cost of $18. For that sum our readers can get this work which gives the results of ten years of painstaking labor by one of the leading designers of Europe. Every textile designer who keeps abreast of the times will realize the value of this treatise, which can appropriately be styled An Unabridged Dictionary of Weaves. The Lord & Nagle Co. are the American agents. The book can be seen at our Boston office.

The printing of calicoes has probably existed in India for ages for Herodotus, more than four hundred years before the beginning of the Christian era, wrote of the inhabitants of the Caucasus that they "adorned their garments with figures of animals by means of the infusion of the leaves of a tree, and the colors thus obtained are very durable."

The Mills of Chestnut Hill.

THE STORY OF A CONNECTICUT VILLAGE.

BY JAMES N. TUCKER.

"Distance lends enchantment." Why is it that "Home, Sweet Home," "The Old Oaken Bucket," and "Auld Lang Syne" are immortal in the hearts of all generations? Is it not because their sentiment always finds a vibrant chord in every heart, that carries memory back through all the years to childhood's home and scenes, and awakens all that is sweet, beautiful and holy in human nature?

JAMES N. TUCKER.

It was a sentiment of Emerson's, I think, that nothing in all the future of each individual life will be more beautiful than the sweet memory of the home life, the loves and friendships, the sunny skies, the green fields and leafy woods, as we see them and enjoy them today.

It is a beautiful ordering of Divine Providence that the bitter shall be gradually eliminated from memory, and so, as the years roll on, only the good, the true and the beautiful remain, and a radiant mist settles down upon the past magnifying and glorifying all that we hold in remembrance.

The wealth of history ever remains unwritten. Very much of that which, if known, would glorify the pages of New England history, was written alone in the humble lives of the actors, and, with them, has passed into oblivion until it shall be revealed in the immortal spheres.

Yet, here and there, much as the antiquarian picks up from the long tilled field the Indian arrow and spear heads that tell of a former age, do we pick up little nuggets of tradition and fact that reveal to us the history of a former generation, and tell us somewhat of the heroic struggles and indomitable energy of the pioneer fathers.

I shall try to tell something concerning a little New England hamlet and the people who have dwelt there, their home life, their enterprise, their industries and prosperity.

If you were down in the city of Providence and were to start westward through Westminster Street, and up Hartford Avenue out on to the old Hartford turnpike, and take a walk or drive of twenty miles you would soon find yourself jogging along, up hill and down valley, each hill rising a little higher than the previous one, until, at twenty miles from the city, you would stand upon the tip top of old Jerimoth hill, named for old Jerimoth Brown, one of the earlier proprietors, who now lies buried upon nearly its highest eminence. This hill is 799 feet above tide water and is twin sister to Durfee hill, a few miles to the northeast, which is only six feet taller, and is the highest land in the state of Rhode Island.

Up to this point, as you have ascended from the city, your vision has been limited by the ever rising hills before you, but here

you stand upon the summit, and before you spreads a panorama, beautiful beyond description, and only occasionally rivaled in any land or clime. Half a mile away, and many feet below you, is the Connecticut state line, and for miles and miles beyond spread out the rugged hills and fertile vales of Windham County, the northeastern county of Connecticut, famed for its agricultural products and for its cotton and woolen industries. But the eye rests not here, for beyond rise the hills of Tolland, white capped in the glare of the winter's sun, or of varied shades of green in the summer time, hiding from view the city of Rockville, this side of Hartford. Northwesterly the southern tier of Massachusetts towns spread in view, the line of vision extending into Hampden County. To the north it spreads through Worcester County, taking in its central towns, while above the horizon arise the peaks of Wachusett and Monadnock.

Here is inspiration. Here is New England in miniature. From her rugged hills have gone forth many generations of worthy sons and daughters, who have given form and shape to the destinies of the nation, and have been strong factors in the world's progress and advancement. No wonder that the great Jewish lawgiver sought Jehovah upon the mount, or that the Psalmist said, "I will lift up mine eyes unto the hills from whence cometh my help."

As we stand here on old Jerimoth we notice, westward from us, and about a mile within the borders of Connecticut, and in the town of Killingly, a hill, of beautiful location, but of less magnitude, its base threaded by a silver line of reservoirs. The primeval growth upon this hill was one of stately chestnuts, extending for miles to the northward, and so the hill early received the name of Chestnut Hill, and, although the village of more recent times is known as East Killingly, its early name has never been forgotten and is inseparable from its history.

A century or a little less ago, the prophecy of its industries had not been made. Its people were characters as strong and rugged as the hillsides upon which grazed their flocks and herds. Families of eight, ten, twelve and even more were the rule rather than the exception. The boys helped on the farm in summer and went to school in winter until they were twenty-one, and the girls went to school and assisted their mothers about the various household duties.

As scholars they burned Lindley Murray in effigy and canonized Nathan Daboll, and usually graduated from the country school better prepared for the rough and tumble of every day business than the average professor of athletics of the present day. Occasionally a bright boy aspired to become a schoolmaster, while another's ambition would lead him to enter a law office in town. Once in a while one would migrate to Providence and enter mercantile life, and another would establish a country store at some cross roads, where he would exchange ordinary family commodities, including a fair percentage of New England rum for farm products which, in turn, were marketed in town. The foundation of many an ample fortune has been formed in this manner.

Land was plenty, and to become a well-to-do, forehanded farmer was the ordinary boundary of masculine ambition, while to be able to card and spin and weave the family clothing, and to make butter and cheese and to bake and boil and sew, and finally "marry well," as they termed it, to get a husband who was a "good provider," was about the height of girlish aspiration.

It was rather a dull, monotonous life. No click of telegraph, no interchange of hellos with the central; no nearby electrics, no morning or evening paper. Occasionally a religious paper, a few books, including "Pilgrims' Progress," "Baxter's Saints Rest," or "Call to the Unconverted," Doddridge's "Rise and Progress," and "Watts' Hymns." Once a year appeared the Old Farmers' Almanac, with its wonderful anatomical plate in which the victim endures through all time the combined onslaught of the whole zodiacal menagerie.

The changes of the moon were carefully studied with reference to the best time to plant and sow and kill hogs. The long-distance weather predictions, eclipses, conundrums and problems all came in for prolonged consideration and discussion.

There were husking bees, apple parings, quiltings, sleigh rides, and an occasional trip to town.

Once in a while a peripatetic ministerial tramp would come in and hold meetings from house to house. The people all very religiously went up to the top of the hill each Sabbath to the old church and sat, without fire, in high-backed pews, and suffered and endured through two or three

CHESTNUT HILL LOOKING UP FROM THE VALLEY.

mortal hours of Firstly, Secondly, Thirdly, etc., while the young people goo-gooed and simpered and giggled much after the twentieth century style. An occasional church quarrel enlivened the community, furnishing a rich repast for worldly minded gossips and affording the elect an opportunity to attest their Puritan orthodoxy.

The old stage coach made tri-weekly trips from Providence to Hartford, along the old turnpike, stopping at the country taverns, which were sprinkled along at intervals of a few miles, and leaving little bits of city gossip and news from the outside world to be retailed with other things across the bar and to finally become the social stock in trade of the neighborhood. Thus, in a variety of ways, the half-starved social nature survived.

Meanwhile the yeast of progress was bubbling and getting in its work, and many an alert business man in New England had been bitten by the industrial microbe. Eli Whitney's cotton gin had revolutionized the cotton fields of the South and was opening unprecedented possibilities to New England manufacturers, and to Chestnut Hill had penetrated the news of the birth of industries along the banks of the Blackstone and elsewhere.

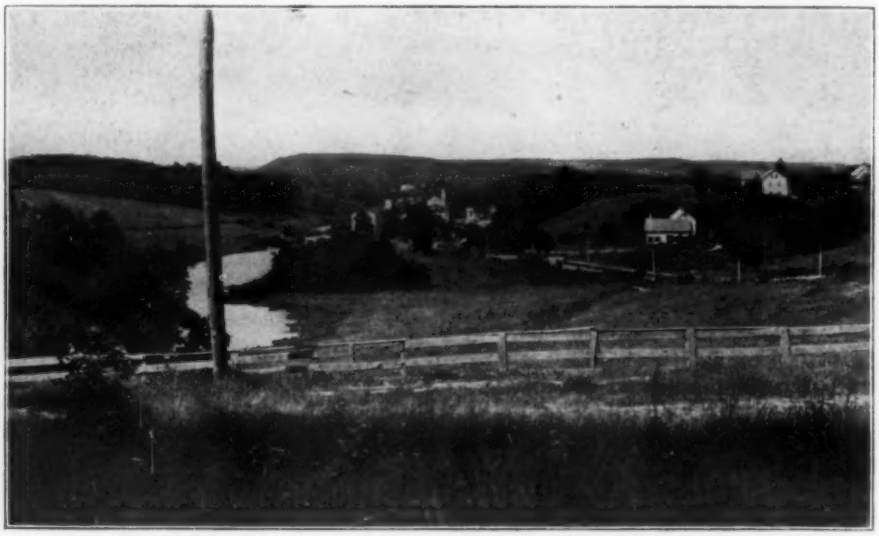
A mile or more northeasterly from where the village now stands was a beautiful landlocked lake, called by the aborigines Chaubaumaug. This lake had a rather slight water shed, being supplied mostly by springs in the bottom of that part of the lake just over the Rhode Island border. This lake is the source of the village stream

known as the Whetstone Brook, so-called because quarries of scythe stones had been found along its borders. A quarter of a mile or so below this lake the stream received a reinforcement of a brook, emanating from Bateman Pond, a dirty little mud hole about a mile northwesterly from Chaubaumaug. This little pond was a pigmy compared with the lake, but, unlike that, had an extensive water shed and, at times in the year, furnished a large supply of water.

Below the confluence of these streams the water shed is extensive, and the result is a stream of no mean proportions and, properly utilized, capable of furnishing hundreds of horse-power. For the first mile its course was across a "flat" of almost dead level, and here it flowed quietly and sluggishly, first through a large cedar swamp of primeval growth, and afterward across a large, natural bog-meadow, upon the annual harvest of which the thrifty farmer wintered his herd of calves and yearlings, which, in a bleak and ill-sheltered stock yard, munched the stuff and froze and thawed and starved until, with staring coats and greedy eyes, they welcomed the springtime sun as the deliverer from that style of winter care which was the refinement of cruelty to animals.

Rounding a promontory at the southeastern limit of where the village now stands, the stream, like a good little boy suddenly released from the leash of his mother's apron strings, starts on to a new career and, swiftly dashing down the rapids, makes within a mile or thereabouts a descent of nearly 200 feet.

The story of the early utilization of this stream for industrial purposes is lost in a mingling of history and tradition. Saw mills and grain mills were the first thought of the early settlers, as supplying their most immediate wants. Early in the century Thomas Burgess built a rude dam at the outlet of the lake and erected a saw mill. Richard Bartlett built a saw and grain mill at a narrow gorge near the head of the rapids. Later on, and mingling with other industries, came the axe and hoe shop of 'Squire Tom Durfee, where the Peep Toad mill now stands. Here the 'squire made axes and hoes for the natives and quite a surplus which he sold in Providence. These hoes were heavy, rude and clumsy, sold without handles, having an "eye" for the insertion of a home-made handle, and would be considered a serious infliction at the present day.



THE VALLEY LOOKING DOWN FROM CHESTNUT HILL.

A blacksmith shop, the bellows of which was run by water power, and a mill for the manufacture of shoe pegs have been among the industrial ventures, but the chief development of the water power of the Whetstone has been in connection with the cotton industry and dates from 1813.

It has been generally supposed that Judge Ebenezer Young built what has from time immemorial been known as the Young's mill, in 1815, but further research compels the conclusion that a small mill was built on this site in 1813 by Joseph Hawes of Providence, and run by him in conjunction with George Law and Andrew Angel of Killingly, until sold to Young in 1815 or 1816.

THE OLD JUDGE YOUNG MILL.

The mill was built of stone from a nearby quarry, and was of small proportions, and stands near the most rapid descent of the rapids where, within about 500 feet of lineal descent, there is 72 feet fall, capable of developing many hundred horse power. Mr. Young did not utilize all this fall, indeed nearly or quite three-fourths of its possibilities have never been developed, and remain unused to the present time.

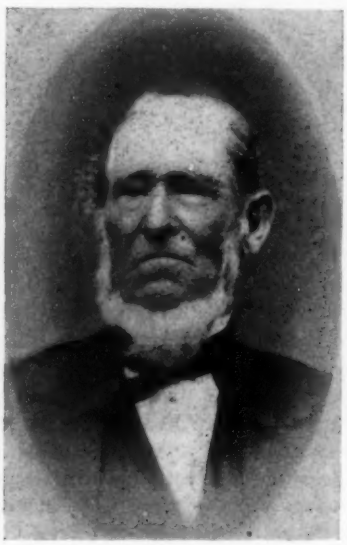
The location of this mill is romantic and by nature almost inaccessible. Here the stream comes tumbling and fretting, frothing and foaming over a solid rock bottom, and closely confined between the rock bound sides of the narrow chasm. Just across this chasm to the south is the beautiful freak of nature known to many generations as the "Island." Originally the stream divided and flowed around each side of its base. It is a rock and fern covered mound, surmounted by a rare collection of New England trees. Tall beeches spread their smooth and symmetrical arms heavenward; lofty elms bend their graceful heads in devotional attitude; magnificent chestnuts revel in primeval glory; gnarled oaks toss and sway their muscular arms; maples run their annual round of kaleidoscopic variegation, and birches in endless variety, clad in silvery garments, add a wealth of beauty, while hemlock and fir adorn the summit with a perennial and fadeless crown. Beautiful flowers and rare ferns cover the surface with a carpeting unrivaled in any oriental palace. Whether in the alabaster fern fringed whiteness of winter, or in the varied shades of summer greenness, or adorned by the multi-variegated hues of autumn, it furnishes a scene of which the artist's eye never wearies. At its base the waters of the rapids, after their wild rough and tumble, spread out in placid tranquillity, mirroring all of nature's glories and adorning them with golden sunlight, cerulean skies and white flecked clouds, the whole furnishing a scene of beauty rarely rivaled and never excelled by pencil or brush.

The prosaic little mill was small, but it grew. Its body enlarged. An outside weave room was built. Various wings were added. Finally the main building was fifty by seventy-five feet with five floors. Two wings adjoined, one fifty by sixty feet with four floors, and the other forty-five by sixty and three stories high. The final capacity of the mill was six thousand spindles and one hundred looms. Through varied fortune the business was in the main a fairly prosperous one.

Judge Young built his residence here among his neighbors, which remains to this day, a fit and enduring monument to the owner's characteristic thoroughness. In addition to his industrial venture he practised law in town, having opened a law office in

West Killingly (now Danielson) Nov. 11, 1809. He became an ardent Whig politician, was exceedingly popular, received judicial honors, represented his town in the General Assembly in the House in 1817, in the Senate in 1823, and again in the House in 1827 and 1828, in each of which two latter years he was elected Speaker. He represented his district in Congress from 1829 to 1835. He died Aug. 18, 1851, aged 67 years.

After the death of the judge, his son, Ebenezer Young, Jr., took the mill and operated it until his death in 1871. He was remarkably successful and acquired an ample fortune.



JOHN WHITE.

Inseparable from any history of this mill is an allusion to "Super" John White, its veteran superintendent. His term of service was longer than that of any other superintendent in our mills, with the exception of those of Welcome Bartlett and Albert W. Greenslit.

Mr. White was born in Burrillville, R. I., Jan. 6, 1805. After his boyhood and a few years on the farm, he learned the carpenters' trade, but after a few years went to Woonsocket and worked in the mills there. He worked for a number of years and arose to the position of overseer. He came here in 1847 and remained in charge of the Young's mill for twenty-five years. He was a man of rough exterior, but of kindly heart; a man intense and practical, rough hewn from the mass of New England humanity. He had no lazy bones, but was the soul of energy, and commanded all others to toe the mark of his practical ideals. His vocabulary often abounded with volleys of explosive adjectives, and diplomacy was not in his role. Yet, as he entertained a high regard for justice and fair dealing, and hated and despised shams, he stood high in the regard of his employees. He was an inveterate joker and story teller, and the reverberation of his laugh was something to be remembered. Unlike his chief he was a Democrat, and continued to vote and hurrah for Jackson until the end of his days.

(To be continued.)

THE DEDICATION OF THE BRADFORD DURFEE TEXTILE SCHOOL, FALL RIVER, MASS.

An important event in the history of technical education in Massachusetts occurred in Fall River on March 4, when the Bradford Durfee Textile School was dedicated, preparatory to the opening of the school for instruction on the following Monday, March 7, 1904. This is the third textile school to be established under the Act of 1895.

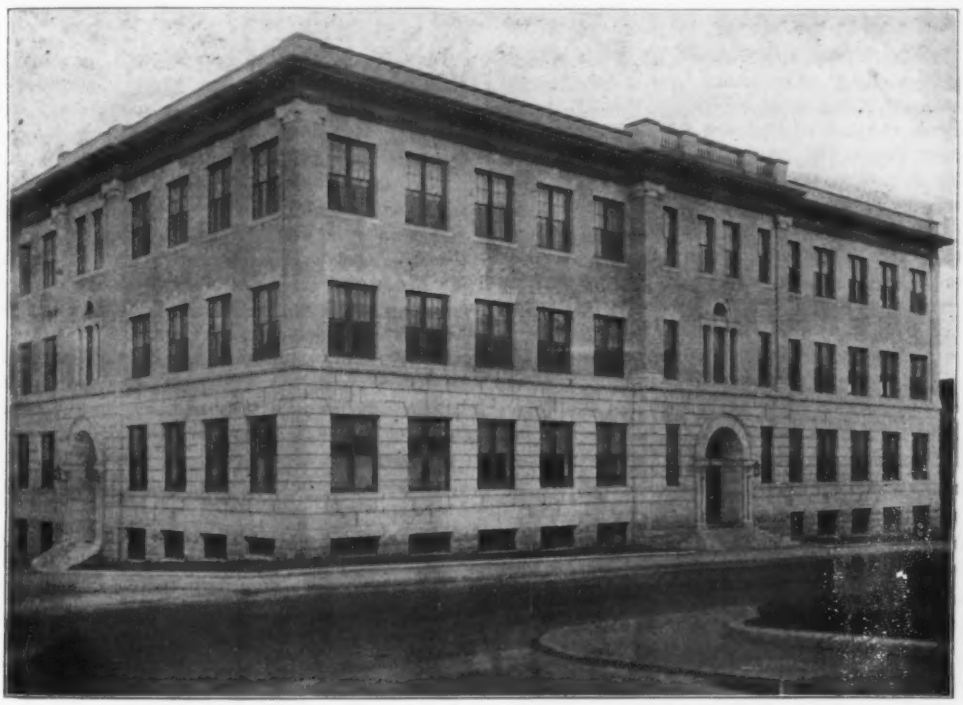
The school is organized and is to be conducted primarily for imparting instruction in the manufacture of cotton goods. It is situated in a city where there are nearly 3,500,000 cotton spindles in operation, and in a state having 8,500,000 spindles in the same branch of textile manufacturing. It, therefore, is surrounded by a large population engaged in the manufacture of cotton and in need of technical instruction in this branch of the textile industry.

The building has been planned and equipped to accomplish the object so highly favored by the location. The plant cost about $180,000, of which a large part was contributed by private individuals. The fine equipment consists largely of machines

and appliances presented by builders of the same.

The officers of the school are as follows: President, Leontine Lincoln; vice-president, William Evans; clerk, William Hopewell; treasurer. Arthur S. Phillips. The faculty consists of Joseph W. Bailey, principal; William H. Hartley, instructor of designing; Frederick H. Webster, A. M., chemistry and dyeing; James T. Broadbent, carding and spinning; John Kniveton, weaving; Herbert M. C. Skinner, B. S., drawing.

He then introduced Governor Bates, who delivered a brief address in which he stated clearly and emphatically the general trend of education at present toward practical objects. While not losing sight of the absolute value of classical studies, he expressed his belief in the greater comparative importance of training in industry and commerce and to fit the individual to meet the requirements and emergencies of daily life. He gave many practical illustrations, concluding as follows:



THE BRADFORD DURFEE TEXTILE SCHOOL, FALL RIVER, MASS.

A large number attended the dedication exercises, including Governor Bates and other state officers and members of the legislature. After lunch had been served the visitors made a tour of inspection of the school, after which the dedication exercises began with an invocation by Rev. William W. Adams, D. D. President Lincoln, who presided, made the opening remarks, in which he outlined the plan on which the school had been founded and pointed out the great work it was designed to accomplish.

"This building stands as a monument to the progressive character of the commonwealth, to the enterprise of the city and to the generosity of public spirited men. It illustrates a most hopeful tendency of our times, a disposition to help men in such a way as to enable them to help themselves.

"Boston, Springfield and Cambridge have established mechanic art high schools. In Boston you will find 38 manual training schools. There are also in Boston 28 cookery schools as a part of the public school system. These and the sewing classes indicate something of the value that the city is placing at the present time upon doing the simple, but necessary things of life well. At the

North End there are 10 classes of adult Hebrews every night attending the educational centre provided by the city of Boston and acquiring their first knowledge of the English language. I extend the greeting and the congratulations of the commonwealth to the city of Fall River upon this occasion so full of meaning, to the Board of Trustees, who have so nobly planned and so much achieved in the beginning of this enterprise, and I join with you all in dedicating this building to the progress of the textile industry, to the advancement of the people, and to the improvement of the conditions of man."

Mayor Grimes, of Fall River, who followed, said in part:

"Fall River was a little town 101 years ago. It became a city 51 years later. This is the 50th anniversary. From a place of 1,000 in 1803 it increased to 13,000 in 1854, and to nearly 120,000 the present year. The first factory was a three-story 60 by 40 building of 1,500 spindles. Now we have over 3,000,000 spindles running and this is the foremost textile manufacturing city in all the western hemisphere. The wealth of the city has all been earned here. The city contains the largest cotton plant in the world, the Iron Works Company. There is an annual broadening of sympathy between labor and capital. No leisure class is here; everybody works, from office owners to floor sweepers."

The next speaker was Carroll D. Wright, who delivered a carefully prepared address which was listened to with close attention. It was replete with practical information. No abstract that we can give would do it justice. Its appreciation by the audience was evidenced by the loud cries of "Go on," when the speaker intimated that he might be taking up too much time.

The exercises closed with an address by Congressman William S. Greene, who was the first to urge the petition for a textile school. He traced briefly the growth of Fall River and the rapid development of the cotton industry in that city. He spoke of the cosmopolitan character of Fall River's population and emphasized the great work that was being accomplished by education in moulding the different races into one homogenous American mass.

Fall River is to be congratulated upon the auspicious opening of her textile school. Every one present at the dedicatory exercises must have been impressed with its great possibilities for benefiting the individual and promoting the further development of textile manufacturing.

THE CUBAN MARKET FOR COTTON GOODS.

The following letter from a Havana firm, engaged in the import trade, may give our manufacturers some hints regarding that market:

Habana, Cuba, Jan. 24, '03.

The Textile World Record, Boston, Mass.

Gentlemen:—We enclose you samples which may be of interest.

In reference to the cotton cloth for making cheap suits, beg to say that there is considerable demand for same here, and we would be pleased to have samples of any patterns American manufacturers may care to submit, with prices of same.

We trust that with the reductions in the Cuban tariffs in favor of American spinners, that they may be able to compete for the business in cheap prints. We hand you the price paid in England for goods as per enclosed samples, but since the advances in cotton, we do not think that our jobbers can buy at these prices today.

We do not believe that it will be necessary for American goods to be "loaded" like the English, but the question of narrow widths is important, and it would be well for American weavers to consider the matter of weaving goods of double the desired width and "splitting" which the English mills have found economical.

Yours very truly,

Frank G. Robins & Co.

The samples referred to were different styles of an English print. We have analyzed the fabrics with the following result:

ENGLISH PRINT.

3 1/4 cents per yard, 25 inches wide, at Manchester.

9.08 yards per pound.

Warp, 63 threads per inch 1/42s cotton.

Filling, 58 threads per inch 1/41s cotton.

The fabric contained 21 6/10 of filler, the warp and filling having practically the same proportion. There are, consequently, 11.58 yards of cloth per pound of clear cotton. The counts indicate the sizes without the filler.

We have tried to find an American print corresponding to the English cloth in tex-

ture, but were unable to do so. The lowest priced print we could find is known as the Tuscan batiste, and upon analyzing it we obtained the following result:

TUSCAN BATISTE.

4 1/4 cents less 2 per cent., per yard 27 inches wide.

10 yards per pound.

Warp, 55 threads per inch 1/34s cotton.

Filling, 41 threads per inch 1/41s cotton.

The goods contained 14 7/10 per cent. filler equally distributed between warp and filling. Exclusive of the filler there are 11.96 yards per pound of clear cotton cloth.

Comparing the two fabrics in respect to the selling values per pound of clear cloth, we have:

English print, 11.58 yards 3 1/4c., $0.376 per lb. cotton cloth.

American print, 11.96 yards 4 1/4c. less 2 per cent., $0.498 per lb. cotton cloth.

As Messrs. Robins & Co. state, the price on the English print was quoted before the recent advance. The price of the American was given after that rise, and consequently the actual difference in the selling prices of the two fabrics would be reduced based on the same price for the raw material.

We shall endeavor to submit samples of other fabrics selling in the Cuban market, and make comparisons between them and American goods.

The Origin of Spool Cotton Thread.

Paisley, Scotland, Jan. 22, 1904.

Editor Textile World Record:

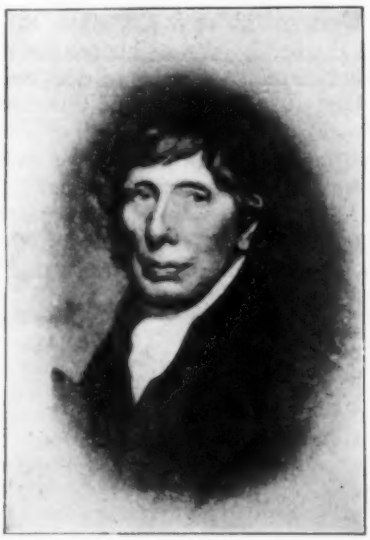
Would you allow me to tell the origin of the spool cotton thread trade and the great dimensions to which it has now attained? Its birthplace is the town of Paisley, Scotland, picturesquely situated in the Clyde valley and still the centre of the cotton thread industry.

In the year 1753 a small farmer named William Clark (my great grandfather) died, leaving behind him a widow and a family of six young children. The widow being left penniless, was obliged to relinquish the farm and remove to Paisley to obtain a livelihood. The family being industrious and careful got on comfortably. Two of the sons, Patrick and James (the former my granduncle and the latter my grandfather) became weavers and later on manufacturers and merchants of material necessary for the equipment of hand looms, or in other words, weavers' furnishers.

Paisley at that distant period was a prosperous hand loom weaving community. The community required much silk for the manufacture of twine to make heddles for the looms, this supply of silk coming from Hamburg, Germany. In 1803 France was at war with Great Britain; Napoleon Bonaparte conquered north Germany and his troops

JAMES CLARK, 3d.

occupied Hamburg. In order to cripple British industries Napoleon caused the stock of silk held in Hamburg to be burned. In these circumstances what were the poor Paisley weavers to do? They were in a



JAMES CLARK, 1st.

state of consternation. My grandfather, James Clark, who was born in 1747 and died in 1829 and whose portrait I submit,

THE COTTAGE ON COTTON STREET.

manufactured heddle twine and heddles in a straw-thatched cottage in Cotton Street, Paisley, as did also his brother Patrick in a similar dwelling situated in Moss Street of the same town.

The supply of the raw material having been destroyed, the two brothers were at their wits end to find out what to do to remedy the calamity, when the happy thought occurred to Patrick Clark to substitute cotton warp yarn for silk and twist it into thread in the manner that six cord thread is made at the present day. Fortunately his experiment succeeded and heddles continued to be made and supplied to the weavers without interruption, and the weaving industry continued to prosper.

My father, James Clark, who was born in 1783 and died in 1865, was my grandfather's

JAMES CLARK. 2d.

assistant. Among other things that he sold was linen thread to women for domestic sewing purposes, cotton sewing thread not being then known to them, and as the linen thread appeared to my father to be rough and lumpy, as he termed it, he strongly recommended the smooth cotton thread as a substitute; the result was that once tried it continued to be used by the fair patrons and the demand increased rapidly.

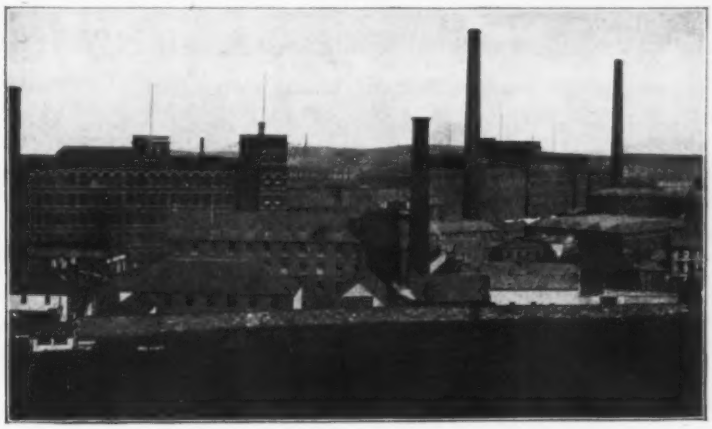
Originally the sewing thread was sold in hanks or skeins; these the women had to wind into little balls as they do a cut of woolen yarn or thread at the present day.

Wishing to convenience the ladies, my father on making a sale of thread would sit down at a pirn wheel and wind the cut of thread upon a spool, for which labor and spool he charged one-half penny or one cent; this cent was refunded when the empty bobbin was returned to him. These bobbins or spools cost 6/ per gross or 12 dozen, of which he ordered half a gross at one time, and carried them in his coat pocket from the turner's shop to his place of business. The turner, named Robert Paul, is long since dead. The bobbins were made in a shop situated at Smith Hills.

The site of this shop is now occupied by a beautiful hall erected in memory of my cousin, the late George A. Clark, by his brothers James, John, Stewart and William Clark. George A. Clark died in Newark, N. J., in 1873. The town hall faces the river and in our illustration the spot where the first thread spools were made is marked with a cross.

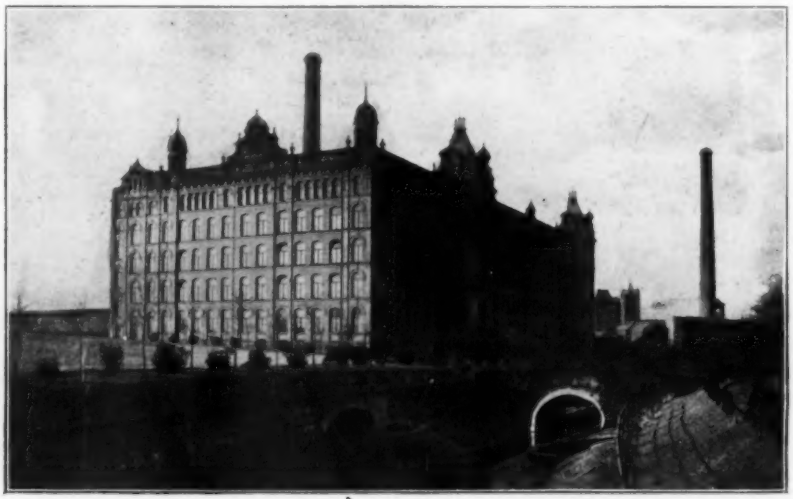
DUNN SQUARE AND CLARK HALL, PAISLEY, SCOTLAND.

Such is the simple story of the birth of the spool cotton thread trade. These reminiscences stretch back over three generations. As time proceeded many thread manufacturing companies sprung up over the United Kingdom. In Paisley alone seven thread companies for many years carried on busi-



CLARK'S THREAD MILL, PAISLEY, SCOTLAND.

ness. Of these only one great combination now remains under the firm of J. & B. Coats, Ltd., embracing the leviathan work of the former firms of Coats, Clark, Brooks Bros. and Chadwick. The accompanying view of Clark's mill was taken from a neighboring hill top, but does not show more than two-thirds of the works. The view of Coats' mills does not show over one-fifth of the plant which is too large to be included in one photograph. The buildings, all situated in Paisley, occupy over 100 acres of ground, possess an aggregate engine force of



COAT'S THREAD MILL, PAISLEY, SCOTLAND.

30,000 H. P., requiring a daily consumption of 400 tons of coal to drive half a million of spindles, and giving employment directly to over 10,000 men and women. Besides these gigantic works, the company possess mills nearly as large at Newark and Pawtucket, U. S. A., as well as works of large proportions in Russia, Germany and Spain. But we must remember that there are other thread companies of large extent that go to swell the marvelous result reached at the present day from the trifling circumstance of my granduncle having substituted cotton warp yarn for silk in the manufacture of heddle twine, and my father in recommending, selling and spooling the heddle twine as a substitute for linen for sewing purposes.

JAMES CLARK.

WHY TEXTILE GOODS SHOULD BE ADVERTISED.

This is the first of a series of papers upon textile advertising by Thomas Balmer, advertising manager of the three publications of the Butterick Publishing Company—The Delineator, The Designer and the New Idea.

1. Necessity and possibilities of textile advertising.
2. Naming and trade-marking textile goods.
3. Planning the advertising campaign.
4. General publicity and work upon dealers.
5. Actual experience of manufacturers whose advertising has been successful.
6. Brief comment upon six different lines which will then be discussed, one at a time, in the six following papers based upon actual statistics collected at an expense of thousands of dollars and an equal value for the time demanded for their collection.

I.

The other day I was discussing advertising with one of the largest manufacturers of woolen goods. He was trying to prove to me that he could not trade-mark his goods to sell them by advertising.

"Marshall, Field & Company, of Chicago, are my largest customers. If I should trade-mark my goods they would never handle them again."

"Do you mean to say that Marshall, Field & Company sell no trade-marked goods?"

"Only what they are compelled to."

"Then," was my answer, "why don't you compel them?"

By "compelling" was meant a demand on the part of the public through the drummer and the wholesaler so insistent that the wholesaler had to sell the trade-marked goods or lose the dealer's trade. This demand was due to advertising and to advertising alone.

My contention was proved. If the jobber can be "compelled" once by advertising, he can be compelled again. If he can be compelled to carry trade-marked suits, skirts or knit goods, he can be compelled to carry fabrics and yarns. Anything made in mills and worn by women can be trade-marked, advertised and sold through the retail stores. The inertia of the jobber has nothing to do with it. He can do nothing to stop the work and but little to help it.

One large manufacturer of women's underwear has but one customer. The customer is a commission house which takes the entire product of the mill. It dictates style, price and quality. It keeps the mill busy a year on one order.

To the commission house come the buyers from the wholesalers, for this underwear is staple as cotton cloth. Among these customers is one who takes this very underwear, trade-marks it, advertises it and does a big business on it, the only asset of which is the trade-marked name.

The manufacturer who makes the underwear is unknown to the women who buy it. They like the underwear; they buy it on the advertising. The jobber, the second in the chain from the manufacturer, gets the advantage of the publicity and the advantage of the manufacturer's good work.

The manufacturer is at the mercy of the commission man. He has no future for his business—no hold upon the trade of the public. No one knows him or his goods. Over the same counter by the same salesman are sold his own unmarked underwear and the underwear manufactured by him, identical in every particular, but trade-marked with the stamp of the enterprising jobber.

If this jobber, who has paid two profits on the underwear, can trade-mark it, advertise it and make money upon his investment, how much more profitably can the manufacturer of the underwear do the same thing?

The reply of the manufacturer will be that to advertise will revolutionize his business; that he has now no office force or equipment capable of taking care of more than one account. He has no bookkeeper and no traveling men. The dry goods trade is an unknown world to him.

Through fear of revolutionizing a business many a manufacturing plant is dying of dry rot. One cannot do business with eighteenth century methods in the twentieth century. The man who adheres to old methods of manufacture because modern methods will revolutionize his business is the man who still writes his letters with a pen, ignoring the typewriter, who sends a boy with a message because he will not introduce the telephone, and who ships his goods by ox-carts rather than use the fast freight trains.

It is no longer a question of choice. It is a case of necessity. The future of his business depends on it.

The only asset of any line of manufactured goods which will stand every test, which cannot be taken away by any business conditions, is the asset bound up in a well-known, well-advertised, popular trade-mark.

These same manufacturers of textile goods who hesitate on the brink of advertising because they doubt, not only the necessity, but the possibility of advertising their goods, are first to admit the success of the trade-mark idea when applied to other goods in different lines. They know that the National Biscuit Company is able to pay ten per cent. upon its investment to its stockholders on account of the successful Uneeda advertising. They know that the name "Royal Baking Powder" is worth millions of dollars to the owners simply as an asset in publicity. They know that the State of Masachusetts has estimated the value of the name "Walter Baker" upon chocolate at a million dollars—apart from any formula, plant, good will or other assets. They know that these are trade marks and names which have been made valuable by advertising, but they do not follow the irresistible analogy and see its aplication to their own business.

Today no woman going to a dry goods store to select the materials for a dress asks for woolen or cotton goods by name. She looks at bolt after bolt, and selects her goods

from her own limited knowledge, unaided and unguided by an advertised brand. The advice of the salesman is all the help she has.

There are some goods which by inherent merit are partially familiar to shoppers; such, for instance, as Priestley's black goods. There are also a few fabrics which are advertised and called for by name, but the great bulk of dress goods are still sold on sight.

No man going to his tailor to select a suit would dream of asking, for instance, for the products of the American Woolen Company. He does not know whether they are good or bad or indifferent. He does not know what sort of a guarantee accompanies them. He takes the word of the tailor for the goods he does select because his own knowledge of woolens is infinitely small.

Is there a cotton, muslin, woolen, cambric or silk which occurs readily by name to a hundred men or women? Yet will any manufacturer say that it is impossible to give a name to any fabric he makes and advertise it until the majority of shoppers will ask for it by name?

It is just as easy to make a woman ask for a given woolen fabric for a dress as it is to make her ask for Uneeda Biscuit or Domino Sugar. Surely if one can successfully trademark and advertise foods, why not the materials for wearing apparel? No woman gives the thought, attention and effort to buying groceries that she does to buying clothes. Where a woman will read an ad. of a cracker or a sugar a hundred women will read an ad. of a dress fabric.

Anyone who is familiar with the anxiety of a woman seeking a suitable material for a dress which will wear well, which is stylish and adapted for its purpose, will see in an instant the importance to her of any advice on the subject.

In no form can that advice be given so well as in the advertising. By no one can it be given so forcefully as by the manufacturer of the goods. He makes the goods; he knows what they are. His word should be authoritative. If he makes an article of which he is not ashamed, it is only a matter of dollars and time before all dress-goods-buying women know the name, the trade mark and the quality of those goods.

The woman who goes to a store with the name of one kind of goods firmly fixed in her mind is going to ask for those goods at least half the time as against the woman who will ask to be shown unknown, untrade-marked goods. The manufacturer whose goods are asked for half the time at all dry goods stores has a business too large to contemplate.

Instead of stopping with the statement that it is possible for the manufacturer of textile goods to advertise profitably, I will go so far as to say that before very long it will be impossible for him not to do so profitably.

There are hundreds of manufacturers today at exactly this place. The end of the usefulness of their present plan is in sight. They have but one future, and that future is advertising, even though it revolutionize their business. It is no longer a case for gentle measures. The surgeon's knife is necessary to cut off the impractical, antiquated, business-paralyzing methods and adopt the mightiest engine ever placed at the disposal of the legitimate manufacturer—advertising.

THOMAS BALMER.

Cotton Goods in the Philippines.

The reports of Philippine imports for August, 1903, show the United States to be third in the list of countries sending cotton goods to the islands. This is a gratifying increase and carries a promise of our ability to eventually take the leading place in this trade. The August imports of cotton goods were as follows:

Great Britain	43.58 %
Spain	10.82
United States	10.01
British E. I.	9.73
Japan	6.47
Germany	5.28
Switzerland	4.76
Other	9.35
	100.00 %

In 1860 this country imported 87 per cent. of all the silk goods consumed here; now but 15 per cent. is imported and we have become the greatest manufacturers of silk in the world.

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

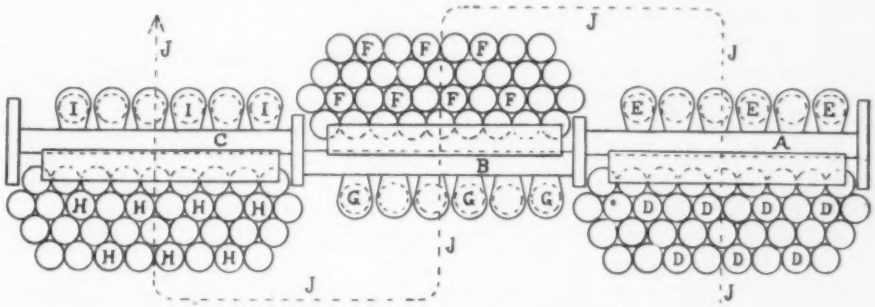
NOTES ON DRAWING.

(Continued from February.)

IN THE EQUIPMENT OF A MILL,

it is always an object to make the best possible arrangement of machinery as to convenience and economy of floor space, and the dimensions of a mill consequently determine the best arrangement to be made in that case. With reference to placing drawing frames, two general arrangements are practically the only ones used at the present time, i. e., the "straight" arrangement and the "cross" arrangement. In the first case, when three processes are used, the frames are placed one in front of the other with all of the delivery ends facing in the same direction, so that the full cans from the first process of drawing can easily replace the empty cans which had been feeding to the second process, the same being true also to the third process frame.

In the Cross arrangement as shown by means of the accompanying diagram, the three frames are placed end to end with each succeeding frame having its delivery end facing in the opposite direction to the one just preceding it. In order to explain the diagram, we will use the letters of reference to indicate the different parts. A indicates the first process drawing frame, B the second and C the third frame. The sliver cans D are taken from the card or comber and fed up behind the first process frame A, doubling six slivers to each delivery. The delivered slivers from the first process are coiled into cans by means of the coilers E and the full cans are then fed up to the second process frame B from the back, the cans so placed being indicated by the reference letter F. The coilers G of the second frame, coil the delivered slivers in the same manner as the first frame, which are in turn fed up to the third process frame C from the cans H placed at the back of the frame. The delivered slivers from the third frame are coiled into cans by the coilers I. The dotted arrow J is used to indicate the direction of the passage of slivers through the three different frames.



IN ORDERING DIFFERENT PARTS FOR A DRAWING FRAME,

it is often necessary to state whether the machine is left hand or right hand, since the parts in many instances will be the reverse of each other for the different frames.

A left handed machine may be determined by the fact that it has its main driving pulley on the left hand side when standing facing the delivery of the machine, the delivery end of the machine, as we have previously intimated, being the place where the sliver is being delivered in a finished state by the coilers, with reference to that machine.

A right hand machine would indicate that the main driving pulley is on the right hand side when facing the delivery end of the frame.

There are four pairs of rolls in the usual

type of drawing frame, each pair consisting of a top and bottom roll. The different pairs of rolls in a frame are known by several different names, for instance, they may be called the front, first intermediate, second intermediate and back rolls respectively, indicating that the front roll is the one nearest the delivery end of the machine, the first intermediate being next to the front roll, and so on in succession to the back roll, which of course is nearest the feed end of the machine. The pairs of rolls are also known as the first, second, third and fourth pairs respectively, the first pair being nearest the delivery end of the frame. Again, they may be known respectively as the delivery, second, third and feed roller, the delivery roll being, as its name indicates, the one nearest the delivery end of the machine, while the feed roll is nearest the feed end of the machine.

TO MAKE GOOD WORK

on the drawing frame, it is important to run light slivers at the commencement of the operation, and to draw light, and carefully regulate the drafts, being careful not to draw too much between the back and third rolls or between the third and second rolls, where the bulk of cotton is very heavy and the distances between the pairs of rolls are greatest.

The top rollers should be kept in perfect working order, that is, well covered, the best of oil used for lubrication, and well cleaned. It is very important that the cap bars for holding the top rolls are fitted up nicely, and that the top rollers are perfectly in line with their fluted bottom rollers. The sliver traverse motion, as used in connection with leather covered top rolls, should be fitted up in a thorough manner, to change quickly at the ends of the traverse, in order to prevent the top rollers from becoming uneven in certain places on their surfaces. It is very important that the slivers are firmly held in the drawing process, as the slipping would be sure to make uneven work. The better the fluting of the rollers is preserved, the better will be the drawing of the slivers, not only in their evenness, but the staple will be freer from that polished and glassy condition which causes the slivers to stretch apart easily in the future operations of drawing and in all the roving processes and on the spinning frame. The surface of the bosses should run perfectly true, and all imperfect rolls should be discarded and perfect ones be substituted.

THE COILER MECHANISM

by means of which the sliver is compactly coiled in the can is as follows: The coiler head, which is in reality a wheel, is slowly revolved by means of gearing from the calender roll in the machine. The inclination of a funnel shaped hole, and the rotary motion of the head, causes the sliver to be deposited in the can in circles whose diameter is a little more than half of that of the can. The can itself is caused to revolve by placing it on a coiler can stand, said stand being positively driven through suitable gearing from the calender roll. In this manner the circular coils of sliver do not lie on the top of each other. This method of coiling, besides enabling the can to hold more than it would otherwise do, also obviates any risk of sliver being broken or strained while being again drawn from the can. The coiler puts a small degree of twist into the sliver, which is very slight and only gives a very small degree of strength to the sliver if at all.

(To be continued.)

TEXTILE DESIGNING.

LESSON 3.—BROKEN TWILLS.

These weaves are of the greatest importance to textile designers, they being extensively used in the manufacture of worsted and woolen trouserings, suitings, overcoatings, cotton and silk dress goods, etc., etc.; the last two or three seasons with reference to men's wear having been what we might call broken twill seasons, these weaves predominating over any other system of weaves used in the construction of these fabrics. Broken twills are derived from the regular twills, i.e., our common 45° twills, by running the direction of the twill for a certain number of warp threads, picks, or warp threads and picks, as the case may be, one way, next arrange a complete break — change of risers to sinkers with reference to the two threads under consideration — and in turn reverse the direction of the twill, and con-

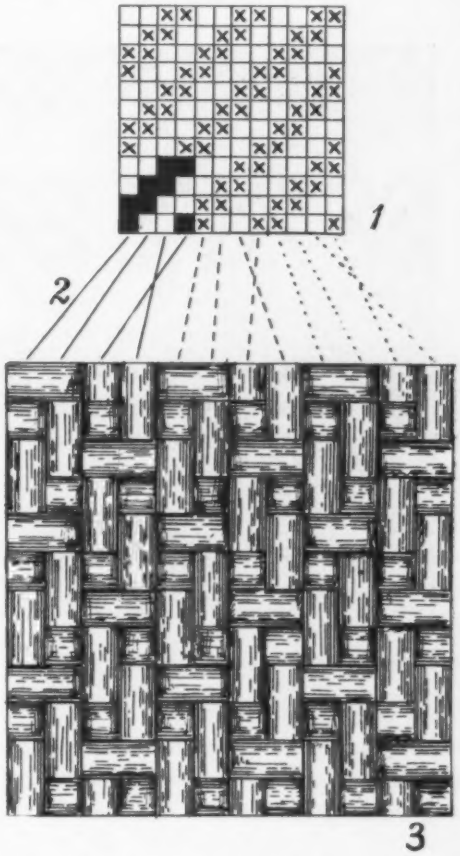
tinue in this manner until the repeat of the weave is obtained. By means of this characteristic break of the twill in the weave we in turn produce a corresponding change of the twill line visible in the fabric. The common or 45° twills as used for the foundation of these broken twill weaves are such as are classified as even sided twills, i.e., twills in which warp and filling effect are balanced, considering warp and filling texture alike in the fabric; for example, the $^{2}/_{2}$ four harness twill, the $^{3}/_{3}$ six harness twill, the $^{4}/_{4}$ eight harness twill, the $^{2}/_{1}{}^{2}/_{2}{}^{1}/_{2}$ ten harness twill, the $^{3}/_{2}{}^{2}/_{3}$ ten harness twill, the $^{3}/_{1}{}^{3}/_{3}{}^{1}/_{3}$ fourteen harness twill, etc., etc. Broken twills are divided into three divisions, viz.: Such as broken warp ways, such as broken filling ways, and finally, such as broken warp and filling ways. We will in turn take up these three different sub-divisions of weaves, and show the student how to design any number of new broken weaves, since the number of even sided foundation twills is great, and the different changes these foundation twills can be subjected to, unlimited.

BROKEN TWILLS, BROKEN WARP WAYS.

(a) *Even or Balanced Effects:* Run your foundation twills for a certain number of warp threads from left to right (/), next for a certain number of warp threads from right to left (\), being careful to arrange a complete break between the two warp threads where you change the direction of the twill. The lowest number of harnesses you thus can design a broken twill is four, after which they can be designed for any even number of harnesses, a feature which, at the same time, will indicate to you that these weaves cannot be made with a clear cut-off for uneven number of harnesses, since it is impossible to design an even sided twill for an uneven number of harnesses for repeat, since in this instance either warp or either filling—considering even texture in the fabric — would predominate. An explanation of the construction of these weaves is best given by means of the accompanying diagrams, 1, 2 and 3, and of which diagram 1 indicates 12 × 12, i.e., 3 repeats of the common $^{2}/_{2}$ four harness twill, one of the repeats being shown in ■ type, the others in ⊠ type. Lines indicated by 2 show the drafting of this four harness twill in order to obtain the broken twill shown in fabric sketch Fig. 3. Considering one repeat of the twill, in connection with solid lines, and one repeat of the fabric sketch we find that

Warp thread 1 of the foundation twill equals warp thread 1 in the broken twill fabric sketch.

Warp thread 2 of the foundation twill equals warp thread 2 in the broken twill of fabric sketch.



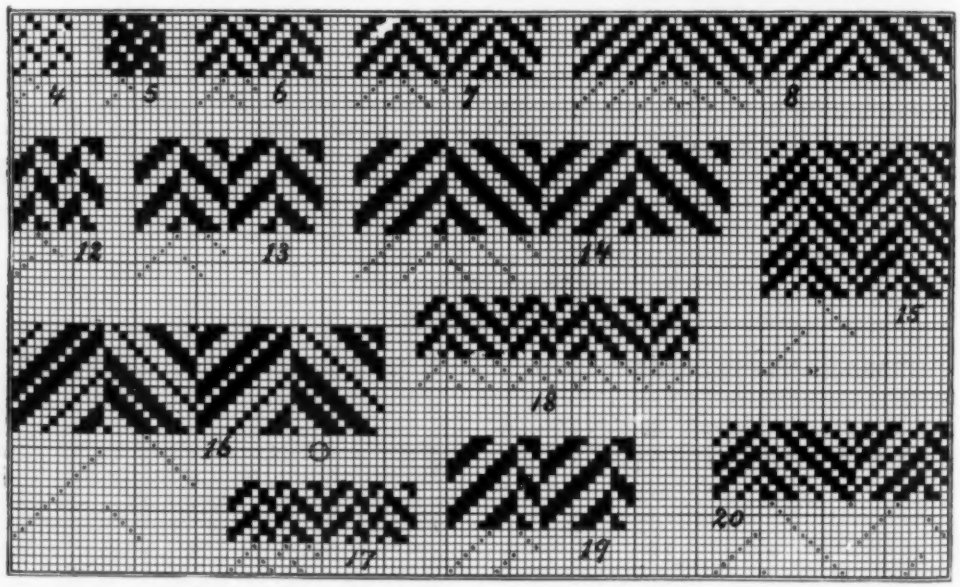
Warp thread 3 of the foundation twill equals warp thread 4 in the broken twill of fabric sketch.

Warp thread 4 of the foundation twill equals warp thread 3 in the broken twill of fabric sketch.

This explains one repeat of the broken twill. The second repeat of the affair is given by

means of dash lines; the third repeat of the affair is shown by means of dotted lines. This broken twill is technically indicated as $\frac{2}{2}$ 2/ 2\ four harness broken twill.

Weave No. 4 shows the $\frac{1}{3}$ four harness 45° twill arranged by means of two warp threads running its twill from left to right, and two warp threads running its twill from right to left for a broken twill. This weave, practically speaking, is *no clear broken twill*, since it is against our statement previously made — to use only even sided twills for foundation; the weave having



been given to the student for the fact that it is one of the most important weaves for any textile designer, and is continually in use. It forms what we actually might term the four harness satin, called by others the four harness "crow-foot" twill, and is used extensively as a face weave for doeskins, beaver, and similar face finished fabrics, in which instance a warp effect finish is required, i.e., the weave as given in diagram Fig. 5 being the one used for these fabrics, and which is the $\frac{3}{1}$ four harness broken twill, i.e., the warp effect of this broken twill compared to weave Fig. 4, which is the filling effect of this twill. Both weave effects 4 and 5 are also extensively used in the manufacture of cotton and worsted dress goods against each other, one of these weaves forming the figure, whereas the other forms the ground, thus producing figures in the fabric by means of warp effect against filling effect. Both weaves are also frequently used in combination in the manufacture of shawls, although their application to the complete weave in this instance is different from that for single cloth previously referred to. Dotted type below either weave Fig. 4 or 5 indicates the "foundation draw" and corresponds to the connecting lines 2 between weave Fig. 1 and fabric sketch Fig. 3, previously explained.

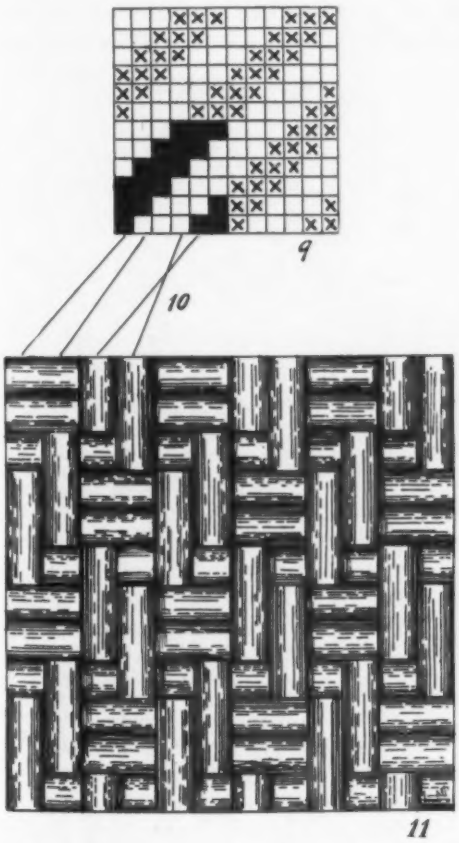
Weave Fig. 6 shows a more pronounced broken twill effect, or what we might technically call a small "herring-bone effect," the foundation weave being the $\frac{2}{2}$ four harness twill, arranged 4/ warp threads, 4 warp threads \, repeat of weave 8 × 4. The dotted type below weave indicates the drafting, i.e., construction of this weave from its foundation weave.

These construction drafts below the weaves can be used as fancy drafts provided we deal with cam looms, or when limited to the number of harnesses in any shape or form in connection with fancy combination weaves, and in which

instance, by means of these fancy drafts shown in dotted type the broken twill is obtained by using the foundation twill for the harness chain, or in connection with the harness chain, provided we deal with a fancy weave.

Weave Fig. 7 shows a larger effect for these broken twills, i.e., drafting 6 warp threads /, 6 warp threads \, the complete weave repeating on 12 × 4. The construction draft from its foundation twill is again given below the weave.

Weave Fig. 8 shows a still larger herring-bone effect, i. e., broken twill, in this instance arranging the four harness even sided twill to run for 12 warp threads in a straight twill line from /, and in turn for 12 warp threads in a straight twill line from \, i. e., reverse, the repeat of the weave being 24 × 4.



Weave Fig. 9 shows a common $\frac{3}{3}$ six harness 45° twill, Diagram 10, the drafting required for this weave to produce fabric shown in Fig. 11, the weave for this fabric being technically known as the $\frac{3}{3}$ six harness 2/ 2\ broken twill, repeating on 4 × 6. In this instance we only use four warp threads from the six of of the foundation twill for the construction of the broken twill, two of the threads from the foundation twill being missed. This weave is what we consider a small broken up effect, similar to fabric Fig. 3, both resembling to a certain extent "granite effects."

Weave Fig. 12 has for its foundation the same 45° twill, arranged 3/3\, the weave repeating on 6 × 6. Dotted type below weave is the foundation draw, i.e., shows how the broken twill can be obtained from the regular or foundation twill, and which draw can be used for producing the broken twill fabric, provided we deal with cam looms or fancy combination weaves, where we are more or less restricted to the number of harnesses at our disposal with reference to a certain effect. For instance, the same chain, by means of a straight draw, will in a certain portion of the fancy fabric produce regular twill effect, whereas, by means of the fancy draw 1, 2, 3, 6, 5, 4 the broken twill effect, i. e., the granite effect, is obtained in the fabric.

Weave Fig. 13 shows again a small herring-bone effect obtained from the $\frac{3}{3}$ six harness twill by drawing 6 warp threads one way and 6 warp threads the other way, arranging between the reversing of the twill the characteristic break effect. Repeat of weave 12 × 6, and which weave by means of its construction draw as shown by dotted type, can be woven on six harnesses.

Weave Fig. 14 shows a larger herring-bone effect produced again by means of the $\frac{3}{3}$ six harness twill for its foundation, drafting 12 warp threads one way and 12 the other way, with the characteristic break between the change of twill, the result, i.e., the broken twill repeating on 24 × 6, the foundation draw below weave in dotted type indicating the construction of the weave from its foundation twill, as well as how to produce the new weave on six harness by means of a fancy draw.

Weave Fig. 15 has for its foundation the $\frac{2}{1}\frac{2}{2}\frac{1}{3}$ ten harness even sided 45° twill, the

change in the direction of the twill line in the fabric being arranged for 6 warp threads one way, 6 the other way, the weave repeating on 12 warp threads and 10 picks. Dotted type below weave indicates the foundation draw, i.e., the fancy draw to weave this broken twill on ten harnesses, if so required.

Weave Fig. 16 has for its foundation the $^{3}_{1}{}^{3}_{3}{}^{1}_{3}$ 45° twill, arranged with 12 warp threads / twill to alternate with 12 warp threads \ twill, the new broken twill repeating on 24 × 14, but which weave by means of its construction draw as given below weave in dotted type can be woven on fourteen harnesses.

Until now we always have shown balanced twill lines, i.e., using the same number of warp threads for left to right and right to left twill, i.e., balanced effects.

(b) *Uneven Drafting.* We now come to broken up effects, i.e., broken twills in which the number of warp threads running from left to right vary with those running from right to left. The affair will be readily explained by means of weave Figs. 17, 18, 19 and 20.

Weave Fig. 17 has for its foundation the $^{2}_{2}$ four harness twill, drafted thus: 4/2\2/4\, the new weave repeating on 12 × 4, and which weave by means of its draft as shown in dotted type below weave, can be woven on four harnesses, if so required for one reason or the other.

Weave Fig. 18 has again for its foundation the $^{2}_{2}$ 4 harness twill, drafted thus: 4/8\4/2\4/8\4/2\, the new weave repeating on 36 × 4, the draft for it being given below weave in dotted type, and which calls for four harnesses to reproduce the affair.

Weave Fig. 19 has for its foundation the $^{3}_{3}$ six harness twill, the drafting being done for 9 warp threads in one direction with for 3 warp threads in the other direction, the new weave repeating on 12 × 6. The foundation draft given below weave will readily explain its construction, or will serve as fancy draw, if so required.

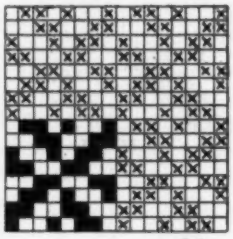
Weave Fig. 20 has for its foundation the $^{2}_{1}{}^{2}_{2}{}^{1}_{2}$ ten harness twill drafted for 6 warp threads / to alternate with for 12 warp threads the other way; repeat of weave 30 × 10 as clearly shown by means of its construction draw given below weave.

BROKEN FILLING WAYS.

No special explanation for this division of broken twills will be required since they are little used, and if so, the weaves previously given will at the same time explain this special division of broken twills, by turning the series of weaves, given before, 45°, i.e., breaking the foundation weave filling ways in place of, as we have done before, warp ways.

BROKEN WARP AND FILLING WAYS.

For this division of broken twills, the break and change in the direction of twill is done both warp and filling ways, producing in this manner a class of very neat weaves for men's as well as women's wear. Their construction is best explained by means of a few practical examples.



21

22

(a) *Balanced Effects.* Weave Fig. 21 shows four repeats of a $\frac{2}{2}$ four harness broken twill, broken for four threads one way, four threads the other way, both in the direction of the warp and the filling. One repeat of the weave (8 × 8), is shown by means of ■ type, the other repeats being given by means of ⊠ type.

Diagram Fig. 22 is the fabric sketch corresponding to the previously given weave.

Weave Fig. 23 has for its foundation the common $\frac{2}{2}$ four harness twill, arranged warp and filling ways for 8/8\, the new weave repeating on 16×16. This weave, if required, can be woven on four harness by means of its construction draft given below in dotted type.

Weave Fig. 24 has for its foundation the $\frac{3}{3}$ six harness, 45° twill, arranged 6/6\, the new weave repeating on 12 × 12, and which weave can be woven on six harness by means of this fancy draw, given below weave in dotted type, if so required.

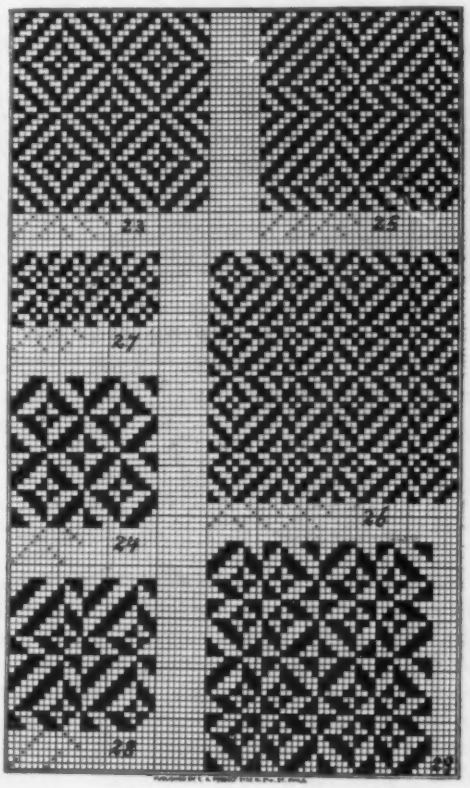
(b) *Uneven Drafting.* We now come to uneven drafting, i.e., using twill pieces of different dimensions against each other. To explain this sub-division of broken twill weaves, Figs. 25 to 29, inclusive, are given, and of which

Weave Fig. 25 has for its foundation the $\frac{2}{2}$ four harness 45° twill, drafted 12 warp threads one way, 4 the other way, both warp and filling ways, the new weave repeating on 16 × 16, and which weave can be woven on four harness, if required, by using the foundation draw for the weave as given below it in dotted type.

Weave Fig. 26 has also for its foundation the four harness even sided twill, the drafting being thus, 4/8\2/6\, the new weave repeating on 20×20, its foundation draw being shown below weave in dotted type, and by means of which said weave can be produced on four harness, if so required to be done.

Weave Fig. 27 has again the four harness even sided twill for its foundation, the drafting in this instance being 4/2\, the new weave repeating on 12 × 12, i.e., two repeats of the drafting are necessary for one repeat of the weave, for the fact that the first drafting does not produce the proper repeat, as will be clearly seen by means of foundation draft for the weave given below it in dotted type, and by means of which said weave can be woven on four harness if necessary.

Weave Fig. 28 has for its foundation the $\frac{3}{3}$ six harness twill, drafted 9/3\, repeat of weave 12 × 12. Foundation draft below weave shows how to produce this weave on six harness if necessary.



Weave Fig. 29 has again the $\frac{3}{3}$ six harness even sided twill for its foundation, the drafting being thus: 6/3\3/6\, repeat of weave 18 × 18; two repeats of the weave each way are again given in order to show up the neat effect of this weave with reference to the fabric.

With explanation of construction of broken twills thus given, the student should be able to readily master the following

LESSON:—

Construct broken twills, broken warp ways (also make out its foundation draws).

FOUNDATION.

		Repeat of Weave.
Ex. 1.	$\frac{2}{2}$ 4 harness, 45° twill, 24/24\	48 × 4
Ex. 2.	$\frac{3}{3}$ 6 harness, 45° twill, 16/16\	32 × 6
Ex. 3.	$\frac{4}{4}$ 8 harness, 45° twill, 4/4\	8 × 8
Ex. 4.	$\frac{4}{4}$ 8 harness, 45° twill, 12/12\	24 × 24
Ex. 5.	$\frac{2}{1}\frac{2}{2}\frac{1}{2}$ 10 harness, 45° twill, 20/20\ ...	40 × 10
Ex. 6.	$\frac{3}{2}\frac{2}{3}$ 10 harness, 45° twill, 6/6\	12 × 12
Ex. 7.	$\frac{3}{2}\frac{1}{1}\frac{2}{2}$ 12 harness, 45° twill, 8/8\	16 × 12
Ex. 8.	$\frac{2}{2}$ 4 harness, 45° twill, 2/4\	12 × 4
Ex. 9.	$\frac{3}{3}$ 6 harness, 45° twill, 3/6\	18 × 6
Ex. 10.	$\frac{3}{2}\frac{1}{1}\frac{2}{2}$ 12 harness, 45° twill, 6/3\3/6\ .	18 × 12

Construct broken twills, broken warp ways (also make out its foundation draws.)

FOUNDATION.

		Repeat of Weave.
Ex. 11.	$\frac{2}{2}$ 4 harness, 45° twill, 16/16\	32 × 32
Ex. 12.	$\frac{3}{3}$ 6 harness, 45° twill, 18/18\	36 × 36
Ex. 13.	$\frac{4}{4}$ 8 harness, 45° twill, 12/12\	24 × 24
Ex. 14.	$\frac{2}{2}\frac{2}{3}$ 10 harness, 45° twill, 10/10\	20 × 20
Ex. 15.	$\frac{2}{2}$ 4 harness, 45° twill, 4/2\2/4	12 × 12
Ex. 16.	$\frac{2}{2}$ 4 harness, 45° twill, 4/4\2/4\	28 × 28
Ex. 17.	$\frac{2}{1}\frac{2}{2}\frac{1}{2}$ 10 harness, 45° twill, 6/12\9/3\	30 × 30
Ex. 18.	$\frac{2}{1}\frac{2}{2}\frac{1}{2}$ 14 harness, 45° twill, 8/4\	84 × 14

BRUSSELS AND WILTON CARPETS.

THEIR CONSTRUCTION AND MANUFACTURE WITH PRACTICAL POINTS ON DESIGNING.

(Continued from February.)

POINTS ON DESIGNING.

The method by which the design for a Brussels carpet is prepared is thus: A small drawing, sketch or model of the pattern is first prepared, usually about one-sixth or about the size that the final pattern will be in the fabric. Fig. 5 shows (reduced in size) such a sketch for a Brussels carpet. This sketch after being approved, is then redrawn on point paper, or, to use technical language, is "put on lines." The standard size of point paper for Brussels carpet has two hundred and sixty squares in its width, each square representing one loop of the pile warp on the face of the woven fabric. Whatever number of squares of these 260 we use, we must keep in mind that the design must be exactly completed (repeat) once, twice, or more times in that number of squares, for if this were not the case, the various stripes of carpeting on the floor, when joined together, would not form complete patterns. The length of the repeat of the pattern is of less importance—except resulting (in an average taken) in more or less waste of material in joining breadths of carpets when putting them on the floor.

A carpet, when in use, is viewed under conditions which are not present in the case of any other fabric. It is always, when on the floor, viewed at an angle, and in gradually diminishing perspective, so that the more distant portions are foreshortened to an extreme degree. For this reason a carpet design requires special treatment, compared to the designs for other textile fabrics. Thus always remember, in connection with a carpet design, that it will be repeated over and over again when on the floor, but that at every repetition it will be foreshortened. Always remember, when preparing a sketch the difficulty you will be under in transferring this sketch onto point paper, i. e., into the full sized working design, and thence into the woven carpet. Submitting finished, i. e., full-sized, designs on point paper, from the start, will undoubtedly be the best plan to avoid an unsatisfactory result in the woven fabric, both to the manufacturer and to the designer.

A well balanced and even distribution of all portions of the design is all-important in a carpet.

Faults are sure to arise, for example, a number of patches of the ground may form ugly stripes, a curve which appears graceful in the design, may when repeated, and on the floor, run into a straight line, prominent portions may be found crowded together on one line, leaving another comparatively empty, etc. And though a deliberate intentional stripe, caused by the repetition of similar objects may produce occasionally a good effect, it must be remembered that accidental stripes, caused by careless distribution, are objectionable. All long straggling lines should also if possible, be avoided, since they are sure to cause stripes. Long stems of flowers or scrolls of ornamental objects, if necessary at all should be broken and thus more or less disguised, either by others crossing them, by objects laid upon them, or when found to be the cause of striping, by radical alterations

Fig. 5

in their direction. Whenever lines have a tendency to run in one direction, this must be counteracted by other lines made to run across them. Never confine main stem lines of floral designs to one breadth.

The pattern, when drawn upon the full sized design or point paper, is the exact counterpart in size, color, and in all other particulars of the fabric to be woven, for which reason the designer constantly sees during his labor the actual fabric growing under his brush, and consequently knows exactly how his design will look in the woven fabric. 10 × 10 point paper is used for the best qualities of carpets, 10 × 9 1/2, 9 1/2 × 9 1/2, 9 × 8, 8 × 8, etc., proportionally for lower grades.

Always keep in mind the "pitch" (i. e. the number of squares or points to the inch) of the fabric for which you are making the design. If making a sketch on plain paper procure a piece of the proper point paper to which the sketch will eventually be transferred, and from time to time carry out some of the finer detail of your sketch on this paper, by means of which you will guard yourself against the introduction of such detail work as is impossible or only imperfectly possible to be executed on the point paper.

In connection with cheaper carpets, i. e., such of coarser pitch, it is frequently difficult to express properly the details of objects without making them unduly large, for which reason much fine detail work has to be frequently sacrificed. It is not easy to hit just the right amount of detail work you can use, and nothing but the carrying out of at least a portion of the design on the proper point paper will keep you on the safe side. However, do not overdo this point and produce in turn coarse and clumsy work. Give the design just the proper amount of detail which the fabric can carry—not more and not less.

Be careful regarding outlines in your design since it is easy on paper to make one color tell against another by means of a fine outline, but when this has to be represented in the actual fabric by a broken line from 1/9th to 1/4th of an inch in breadth, the effect is very different.

Always copy out and lay together several repeats of the first rough sketch whenever possible in order to avoid striping and awkward lines in the woven fabric.

COLORING.

One important point to be remembered in connection with carpet designs is that color is most (if not more) essential than the design itself to the success of a Brussels, as well as any other carpet, and unless you are good at color combination, don't attempt other than simple effects.

A Brussels carpet design in order to be of practical use, must have every patch or mass of color thoroughly distinct and well defined, otherwise the designer's work is only half done. Without this he may produce a pleasing effect on paper, but it may be quite impossible to transfer it into a carpet. In some makes of carpet any number of shades may be used, but though they may be delicate gradation, each tint must be kept perfectly distinct. The designer should never forget that his sketch must be reduced to a definite number of tints when being put on the point paper.

VARIETIES OF DESIGNS.

With reference to the size of Brussels carpet designs, for all over coverings, the width is invariably 27 inches, although for special purposes they are sometimes made wider. Borders are made 13, 18, or 22 1/2 inches wide, the 18-inch width being the most generally used. Full sized, i. e., actual size of woven fabric, point paper is mostly used, although many designers prefer to use a point paper which is only a little more than half size, about 16 inches in width on the point paper representing 27 inches of fabric. But no matter what size of point paper used, in a good make of carpet there should be actually, or in proportion, 9 squares (points) to the inch in the length, and 256 squares (points) in the width of a 27 inch wide carpet, although the standard is 260, but to which only a few manufacturers adhere. With reference to the length of the design there is no standard rule, but from 27 to 36 inches is suitable for small designs, and from 45 to 54 inches for large

ones. However, remember that the length should be no greater than is absolutely necessary in order to avoid too frequent repetition of prominent objects in the woven fabric when on the floor.

BORDERS.

Borders should not be too different in their general character of design, compared to their centre or all over design, neither should they be a mere repetition of the same. They should carry objects similar to

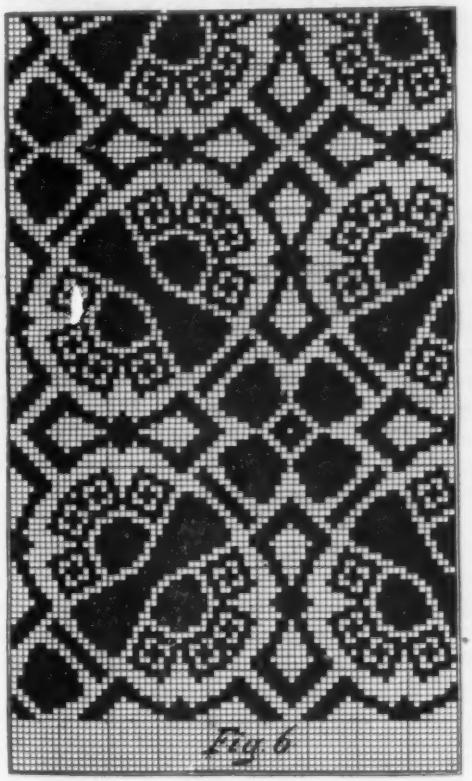


Fig. 6

those of the centre or all over carpet, only on a smaller scale. If the same features are used, they should be at least as large, if not larger, than those used in the centre or all over pattern. Borders should be designed somewhat free and bold, but without strikingly marked figures, since such might tend to produce awkward figures when two borders are "mitred," i. e., joined at the corner of the carpet. As to length of design for the border, it is not necessary for it to be of the same length as the centre or allover design unless in a case of geometrical patterns. In connection with designs for borders in which the centre or all over fabric is extra long, for reasons of economy, keep the design for the border short. Borders, as mentioned before, vary in width —three-eighths, half-yard and five-eighths being sizes in use, although the most common are the two former. A three-eighths border would have, say, 126 ends, and a half-yard 172 ends. The planing of the colors and all other particulars are the same as for the centre carpets.

STAIR CARPETS.

The sizes mostly in use for stair carpets are half yard, five-eighths, three-quarters and four-quarters. The proportions for body and border of a stair carpet are important; the border may be too wide or too narrow. As instances of due proportions, we may mention that a five-eighths stair would have, say, 46 ends for each border and 126 ends for the body or centre, or 218 in all. A three-quarters would have, say, 54 for each border and 148 for the body or centre, or 256 in all.

SIZE AND SETTINGS.

The width of the design for a regular centre Brussels carpet for the great majority of fabrics, being 27 inches and its length being governed by the character of the design, there only remains the question of arangement, i. e., setting and where it has been found by experience that the "plain" setting of figures gives the best results. Wherever possible, that is where the nature of the design will admit of it, the pattern should be made to "drop."

DROP PATTERNS.

Drop patterns do not fit together in the usual manner, as when any given point in the side of one strip of carpeting joins the point just opposite at the other side of the strip. Drop patterns, like common patterns, join, but the parts of the pattern which fit together are arranged in an alternate, instead of in an opposite manner on the sides of the one strip. Drop

patterns not only give a more pleasing distribution of the effects, but at the same time diminish the chance of the pattern "striping," besides having the great practical advantage of reducing the waste when cutting the carpet for a floor by one-half.

There are other patterns which will only join at one side. In these, the parts of the pattern unite at one side of the strip of carpet only, the other side joining with a similar side of the next strip. When sewn together, such carpets have their alternate strips pointing in opposite directions.

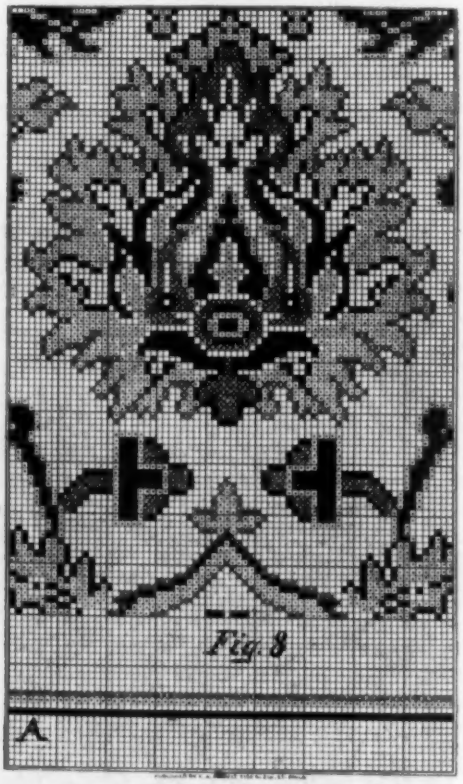
SPECIMENS OF DESIGNS.

A portion of a design for a two frame carpet (a small ornamental pattern) is

given in Fig. 6, a good coloring for it being black figure upon a deep red ground.

Fig. 7 shows a portion of a three frame carpet design, A below the design indicating the color scheme, or gamut as sometimes called, indicating that the three frames are used solid all over the width of the carpet.

Fig. 8 shows a portion of a four frame Brussels carpet, its "color scheme" A, show-



ing that it is a full frame affair; a good coloring for it being □ = deep red, ■ = black, ⊠ = straw, and ⊡ = bright green and yellow twist = "mottled" yarn.

PLANTING.

"Planting" is a very important affair for the Brussels carpet designer, it means to give to the fabric under consideration an improved appearance with reference to design and coloring—not structure—but as design and color are the most important features of a Brussels carpet, the importance of planting will at once become evident. Planting can be resorted to with all frames of Brussels carpets; with a two frame to give it the appearance of a three frame, with a three frame to make it resemble a four

frame and with a four frame to imitate to the eye a five frame. Five frames being as a rule the best carpet made, consequently when more than five colors are wanted in a carpet, recourse must then be had positively to planting. This means that one or more of the frames are divided into bands of color, arranged lengthwise, and when a thread from that frame is brought to the surface it will necessarily produce a loop of whatever color happens to lie in that part of the frame. The frame thus "planted" must be used very sparingly, otherwise, when a number of repeats are viewed lengthwise, the result will be stripes. A great deal of dodging is required to avoid this, which if produced in the carpet, would be a fatal defect. The bands of color in the planted frame may be graduated or shaded from side to side, and subject to the avoidance of striping any number of shades may be used, always remembering the invariable rule: In a five frame design never more than five colors on any one line in the direction of the length. Two, three or four frame carpets, as mentioned before, may also be planted, but while this increases the number of colors available, it impoverishes the effect in another way, for, as the planted frame must be used sparingly, combinations of the remaining three colors will be too prominent.

It is advisable to draw objects which are to be planted so that they overlap each other, so that, instead of stopping abruptly at the line dividing two bands of color, each goes a little beyond it. If the main part of these objects be colored with the all over shades, and if in the central portion, up to the dividing line, the planted color be used, the eye will be pleasantly deceived, and it will seem as if the planted colors overlapped. In making a planted design, a strip of paper should be laid across it, and across this strip bands should be planted, showing the intended arrangement of stripes. On applying this to any part of the design, it will be at once seen how far any particular color may be carried.

A planted design however will be readily noticed in the fabric by the experienced person; if a color appears only in spots, or in small masses of any kind, and these spots or masses are separated from each other by some distance in the width of the carpet, we may feel certain that this color does not go all over the width of the fabric, i. e., planting is done, but if there are a certain number of colors constantly recurring throughout the entire width of the carpet, then the number of colors in the pattern will give the number of the frames in the fabric, i. e., no planting done. A carpet properly planted certainly will command a better sale than one not planted.

Reducing the cost of a Brussels carpet to the manufacturer is a feature frequently resorted to, the feature consisting in saving, i. e., omitting certain pile threads out of each frame; thus there may be five frames of yarn employed in the formation of a carpet, yet some of the rows of loops may be incomplete, threads missing, i. e., not called for in the design. If in this way only a few threads are saved, it means increased profit to the mill; but in some instances the affair is carried so far that a quarter of a frame is missing, sometimes half. If only a few threads are gone, the carpet certainly will be sold as if of the next superior quality; if half gone, it is often sold as of so many frames plus a fraction. It all depends on the design, when well managed, a four-and-a-half frame carpet can frequently be sold as a five frame carpet, and thus the manufacturer save 130 pile warp threads throughout the entire length of the carpet. However, this affair will in turn depreciate the wearing qualities of such a carpet compared to those containing full frames, for whenever threads are left out, the carpet is in this particular place thinner than where all the threads are present.

Any experienced salesman or buyer should be able to spot precisely whether a carpet is three, four, or five frame. With reference to the particular advantage of a five frame over a three or four frame carpet, the same, practically speaking, is thus: There are 1,280 ends of pile warp used, in the complete five frame fabric, of which 256 ends come to the face of the fabric at every

wire, 1,024 ends therefore forming the body of the fabric. The same item with reference to a four frame Brussels carpet is thus: 1024 ends in complete pile warp, and of which 256 ends (the same number as in the five frame) form the face of the fabric, but only 768 ends (in place of the 1024 ends in the five frame) form the body of the fabric, additional hempen or jute or cotton stuffer ends taking the place of the omitted pile warp threads in the body of the carpet fabric. It will thus be seen that a five frame carpet is thicker, softer, and consequently more durable than a four frame, besides more elaborate designs can be utilized.

In the designing of carpets, by the careful manipulation of colors, elaborate effects may be obtained.

To illustrate the unlimited extent to which planting of colors may be employed in connection with Brussels carpets, probably a drab or green chintz pattern forms a good example. For example taking a green chintz, which is a design or sketch in which floral effects are introduced, the designer comes as closely to nature as possible. He may by employing a black, two greens and a yellow color, which may be used for the ground, ornament and foliage—four full frames. The flowers will be in their natural colors (green and yellow), but there would only be one frame remaining, on which these colors may be arranged. Here comes in the skill of the designer. He must arrange the flowers in such positions that only those immediately under each other shall be in the same color. By dotting about in various positions across the width of his design he will have flowers in colors of crimson, scarlet, blue, grey and other shades. Variety in shade in the same flower he gets by striping his flowers downward. Commencing at one side of the pattern, say for example, with deep crimson, and this is used from top to bottom of the flower, say for four ends, then on the next four ends he carries a lighter crimson, and so on, until he comes to the opposite side of the flower, he has the palest pink or even a white. Each flower is treated in the same manner, and a very satisfactory result is obtained. Every change of shade must be indicated on the "color scheme" below the design which in the end may show that on one frame there may be 10, 20 or more shades of colors, a feature which means that one creel alone may contain bobbins carrying 20 or more different shades of colors.

Fig. 9 shows a planted design, referring to a two frame planted, equaling in quality about a two and a half frame affair, as shown by the color scheme A below the design, ⊠ type indicating the planted frame.

PAINTING OF THE DESIGN.

Brussels carpet designs must be painted in solid body color or distemper. Dry

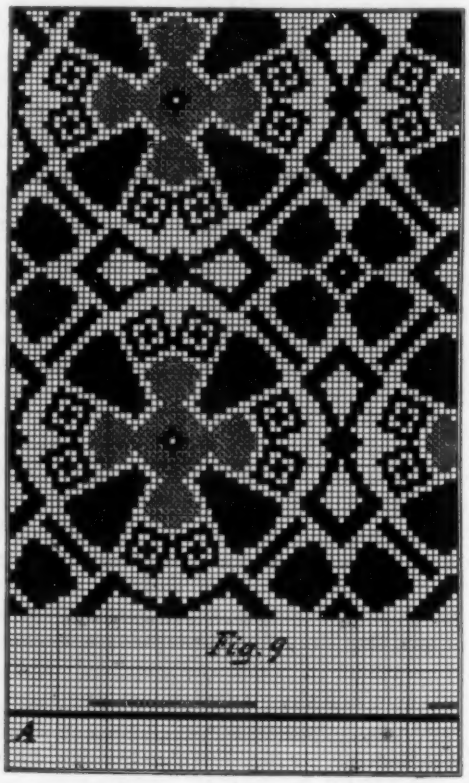


Fig. 9

powder colors ground up with gum are best, but they should dry flat, not glossy. The number of colors to be used in the design should be decided upon before commencing, and enough of each color mixed to finish the design so as to have the same shade of color throughout the entire design.

If, on account of alterations (mistakes), in the design, one color has to be laid over another, the last must be solid painted so it will dry to exactly the same tint as it has in other parts of the design.

If the color be laid on thin, in washes, an irregular effect is got, which cannot be reproduced in the fabric. Solid body colors are thus essential, which in the design will cover the lines of the paper. Keep each tint solid, level, and distinct. Forms must be indicated in the design by masses of color alone, or if outline be used, keep in mind its size in the finished design, i. e., fabric. To make the outline finer than this is misleading; it gives the design more delicacy than it can possibly have in the finished fabric.

Pencil outlines of the figures must not show; if sketch is first made in pencil, all trace of the pencil outlines must be well covered.

In coloring, a Brussels carpet, much can be done to disguise the unavoidable angularity and harshness of the sketch. In connection with soft quiet effects this is comparatively easy, however the difficulty increases with the strength and purity of the color. In coarser fabrics, great care must be used in the distribution of the lightest shades, or, on a light ground, of the darkest. As a rule they should be led up to, and not placed as outlines between shades differing widely from them in depth.

A Brussels carpet design should look equally well on light, medium, and dark grounds, and also both on neutral grounds and on those which have strong color. This feature is obtained by using one color throughout as an outline, however this feature, in connection with a five frame carpet uses up one-fifth of the total color effect, giving at the same time a flatness to the design not always desirable.

THE COLOR SCHEME OR GAMUT.

Immediately under the design for a Brussels carpet is placed the color scheme or gamut. The same indicates the arrangement of the colors in the design. The bobbins carrying the different colors of pile warp are placed on the creels according to the arrangement of the colors on this color scheme, and thus, in weaving, these colors appear in the fabric in their proper positions. This color scheme is thus absolutely necessary, when full frames are not used throughout the design, or when one or more of the frames contain two or more colors. In connection with full frame carpets, this color scheme is only made out to show at a glance that the design in question is strictly a full frame carpet, and being detached from the design can be handed to the weaver to select the proper colors by. The advantages of the color scheme will be readily seen by examining the one shown in connection with Fig. 9 and where color ⊠ only is to be

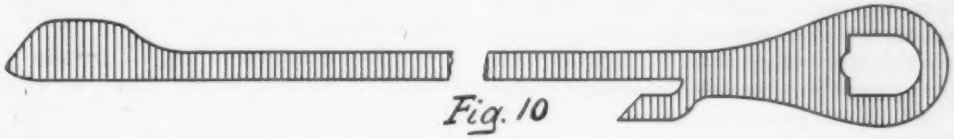


Fig. 10

The colors in a Brussels carpet must be so disposed that the greatest possible number of good effects can be obtained by transposition, and by the employment of entirely different sets of shades from the originals. Provided a color, if altered in the design (except in the case of planting), the same must be altered throughout the entire design, and consequently if a planted color is altered in any one part, the same alteration must be made over the whole of that stripe of the planted frame.

used in a portion of the third frame in the creel.

WILTON CARPETS.

What are termed Wilton carpets may be described as Brussels carpets with a velvet (instead of a looped) pile. They are made in exactly the same manner as Brussels carpets, only the wire over which the pile warp threads pass, in order to make the formation of the looped surface of the Brussels carpet, is somewhat higher, and its

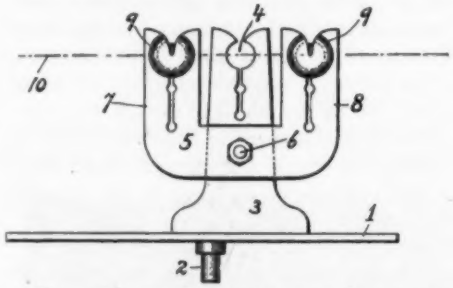
end is flattened into a blade resembling that of a pocket-knife, see Fig. 10, a diagram of such a wire. The increased size of the wire makes bigger loops, and the knife blade cuts the loops as the wire is drawn from the carpet. Owing to this additional length of the pile used in connection with Wilton carpets, compared to that of the loops of the Brussels, a yard of the former contains about one-fourth more yarn, than a yard of the latter, and is proportionally more costly. With reference to the design itself we must keep in mind, that in fabrics with a deep pile, a certain amount of irregularity is caused by the fibres of pile warp threads when cut, falling in all directions, for which reason in Wilton carpets, the design in the fabric will always be slightly more irregular than the design on the point paper.

There is a class of designs (such as repeating by folding) not well adapted for Wilton carpets, since they involve the cutting of a double set of cards, with consequent expense to the mill, those which repeat by folding. The cause of the unsuitability of such patterns is that the pile of every Wilton carpet points, more or less, in one direction, and thus when one strip of carpet points in one direction, and the next strip in the opposite, the joined carpet looks bad. To overcome this, two strips, a left-handed and a right-handed, have to be woven, in order that the pile in the juxtaposed strips may point in the same direction. After leaving the loom this carpet is damped, and then passed over steam drums with the cut loops outwards, and thus the pile is raised to a velvet-like surface, being in turn clipped even on a shear.

Wilton carpets are always so shown that the purchaser looks into the pile, for in this manner they appear better than when viewed along the pile.

AN IMPROVED THREAD GUIDE FOR TUBE WINDING MACHINES.

This thread guide, as lately brought in the market by the Foster Machine Co., of Westfield, Mass., is used in connection with their tube winding machinery on which tubes of small traverse are made, and in which case, for the sake of economy, two tubes are made on one spindle. It will be understood that the tube is made by giving the thread guide, carrying the thread, a reciprocating motion. When making two tubes on the same spindle, it is often necessary to change the size of the tube, which makes it necessary to change all of the double thread guides.



The object of the present improvement is to provide a thread guide which may be easily arranged to suit different sizes of tubes to be wound, and thus save time and cost of extra thread guides. A front view of the new thread guide is shown in the accompanying illustration, and in which numeral of reference 1 indicates a slide which is given a reciprocating motion through a stud 2 which follows the traverse cam on the machine. A post 3 is secured to the slide 1, which is provided at its upper end with a spring socket 4 for receiving and retaining a thread eye. This part of the construction of the thread guide may be used for single tube winding, if desired.

For double tube winding, a cross-arm 5 is detachably secured to the post 3 by means of a screw 6, said cross arm terminating at the ends in upwardly turning pieces 7 and 8, each of which is provided at its upper end with a thread eye socket, in which thread eyes 9 are secured. These eyes 9 are inserted by spreading apart the forked end of the piece 5, inserting the thread eye, and then allowing the fork to spring back into its normal place. The cross arm 5 is made in different sizes to suit the varying sizes of tubes required to be made. If tubes are to be wound an inch and a half in length, the sets of thread eyes are made an inch and three quarters apart, the extra quarter inch

leaving enough space for the slightly protruding ends of the cop quills. When in turn it is desired to wind a number of two inch tubes, two on a spindle, an arm suited to the two inch tubes is applied, requiring only a short time to make the change.

The cross arm 5 is cut in slightly on the inner side for the post 3 to fit into, so as to set the cross arm in the correct horizontal position and maintain this position by simply tightening the screw 6. The dotted line 10 represents the axis of the spindle of a winding machine in which the thread guide is used, and, as will be seen, both eyes 9 are in the same plane with the axis of the spindle, which is a feature of importance in practice for the best results, and which feature is maintained in the present construction.

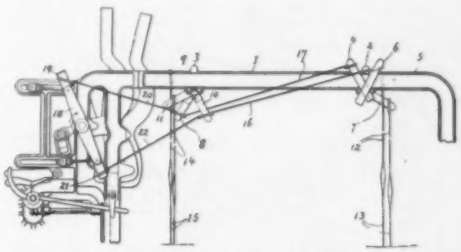
MEATS' SELVAGE MOTION FOR "MASON" DOBBY LOOMS.

The object of the motion is to provide a simple and efficient selvage motion to the loom, the same to work wholly independent of any of the harness jacks of the dobby, in this manner increasing the scope of the dobby.

This selvage motion consists principally of two oppositely movable selvage harness devices, each being situated on opposite sides on the loom frame. These devices are connected to the selvage harness in order to operate them. The movement for operating the selvage motion is obtained from the rocker on the dobby head.

The details of the motion are best explained by means of the accompanying illustration, which is a partial front view of a dobby loom, showing the attachment of the selvage motion. Referring to the numerals of reference in this illustration, 1 indicates the arch of the loom on which are secured the stands 2 and 3. On the stand 2, a lever 4 is connected to another lever 5, while a third lever 6 is connected to a fourth lever 7. On the stand 3, a lever 8 is connected to a lever 9, and a lever 10 to a lever 11. The levers on the stand 2 work on a common pivot, while those on the stand 3 work on another pivot. The levers 5 and 7 are connected to selvage heddle straps 12, the lower ends of said straps being held by springs 13. Levers 9 and 11 are similarly connected to selvage straps 14 on the opposite side of the loom, the lower ends of said straps being held by springs 15.

The levers 6 and 10 are connected by means of the rod 16, while the levers 4 and 8 are connected by means of the rod 17, in this manner providing for working in unison the corresponding heddle straps on each side of the loom.



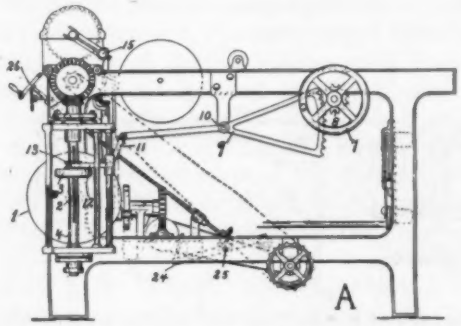
Attached to the top end of the rocker 18 is an extension 19, to which is fastened the rod 20, the other end of said rod being secured to the lever 8. The bottom end of the rocker 18 has an extension 21 to which is attached the rod 22, the other end being attached to the lever 10. The rocker 18, as in all dobbies, receives an oscillation for every pick, so that through the connections explained, the selvage heddles are operated to produce plain weaving independent from the action of the dobby.

Stands 2 and 3 are made movable in order to set the selvage straps to suit different widths of cloth woven. When such changes are made, the lengths of the rods 16, 17, 20 and 22 must also be altered to work properly.

AN INGENIOUS SILK WINDING MACHINE.

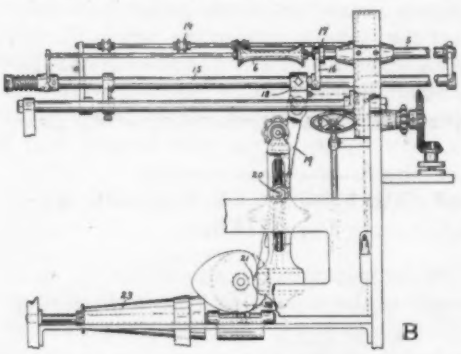
The improvement in this machine, as is brought in the market by Charles H. Knapp of Paterson, N. J., consists in providing means for winding the material on to spools with an even tension as said spools become larger while being filled. This is accomplished by decreasing the speed of the spools as they fill, which consequently necessitates a slower traverse of the spools.

A clear idea of the arrangements to give these different speeds is best given by means of the accompanying illustrations, of which Fig. A is a side view of the working mechanism of the winding machine, showing the parts for decreasing the speed of the spools. Fig. B. is a partial front view of the machine showing the mechanism for regulating the traverse of the material as wound on the bobbin.



Referring to the illustrations, 1 indicates a face plate secured on the shaft 2 which is driven by means of a driving pulley on the opposite end (not shown) of the shaft. This shaft 2 is made movable horizontally so that the face plate 1 may be moved into and out of contact with a friction disk 3 as situated on the vertical shaft 4. By this means, the shaft 5 as carrying the spools 6 is driven through the gearing shown.

In order to vary the speed of the shaft 5,



for the increased size of the spools, the friction disk 3 is made vertically movable on the shaft 4 so as to be driven by different diameters of the face plate 1. This vertical movement is obtained by hand by turning the wheel 7 which is connected to the gear 8, said gear meshing into a toothed segment 9. This segment is pivoted at 10 and has its other end connected to a lever 11, which in turn operates a lever 12, one end of which fits into a groove collar 13 of the friction disk 3.

In this manner the disk is raised or lowered to come into contact with different diameters of the face plate 1, and consequently gives it a quicker or slower speed according to which direction the disk was moved. The spools, being driven from this disk, are given a corresponding rotation, so that as they become filled, their speed is reduced as just explained.

A HORIZONTAL TRAVERSE MOTION

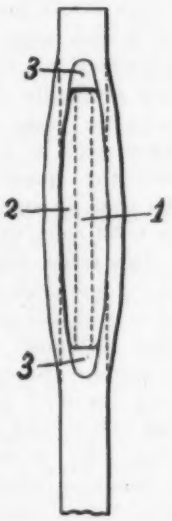
is given to the spools, while the guides 14 remain stationary, The traverse motion is gotten through the shaft 15, which has two forked arms 16 secured to it, the forked ends resting on the shaft 5 on the outside of the collars 17, so that any horizontal motion given to the shaft 15 will be transmitted to the shaft 5 and consequently to the spools 6.

The shaft 15 has a bracket 18 secured to it, said bracket having a stud which fits into the forked end of the lever 19. This lever 19 is pivoted at 20, which centre is made movable vertically so as to regulate the length of traverse for the spools. The bottom end of the lever 20 has an antifriction roll 21 secured on it, which is operated by means of a cam 22, and in this manner the traverse motion is obtained. The speed of the traverse is regulated by the speed of the cam 22 which is driven through the gearing shown from the cone pulley 23. The belt on the cone pulleys is moved back and forth by means of the belt guide 24, which moves on the threaded shaft 25 (shown in Fig. A). The movement is controlled by the hand wheel 26 through the gears shown. Hence to get a slower traverse, the hand wheel 26 is turned to change the position of the belt on the cones.

Cotton goods were not exported from the United States in any considerable quantity until 1826.

AN INGENIOUSLY CONSTRUCTED STEEL HEDDLE.

The object of the improvement is to provide a heddle consisting of a thin flat narrow strip of metal, having end slots and a central eye, formed by slitting the strip at these points and in turn expanding the metal. The bearing surfaces of the openings are reinforced by fins formed by the swaging down of the metal on to said bearing surfaces, in other words, part of the metal from the hole is bent back at each end in order to make the bearing surfaces for the heddle stronger, at these points, the heddles most frequently breaking there. In order to explain the affair more clearly to the



reader, the accompanying illustration is given, and which is a front view of the upper slot of the heddle, showing in full outlines the completed shape of the hole and in dotted lines its shape before swaging. The lower portion of the heddle is provided with a similar slot; the eye of the heddle in turn being similarly constructed. The slot is formed by first slitting the metal, as indicated in dotted lines at 1, and then the metal enclosing the slit 1 is subjected to a swaging operation in order to flatten the metal and to expand the slit 1 into the slot 2. When thus formed, the slot 2 has an upper and lower reinforced bearing surface 3, formed of a thin fin of a swaged metal. The heddle eye at the centre of the heddle is made in the same manner.

If desired, only one fin may be turned back to form a reinforced bearing surface.

PRACTICAL POINTS ON ROLLS FOR DRAWING FRAMES.

Drawing rolls in this machine are the most important parts of the frame as from its name, "drawing or drafting" is the object aimed at, and consequently a great deal of care should be taken to see that they perform their work properly.

THE BOTTOM ROLLS

are made of steel and are usually made up in sections, each section having a square recess at one end and a squared end at the other, so that the squared end of one section fits snugly into the square recess of another, thus producing a continuous roll. The parts of the rolls over which the slivers pass are fluted in order to get a firm grip on the slivers as they pass between the top and bottom rolls. These flutes are sometimes unevenly spaced on the rolls so as to prevent, as much as possible, the top leather covered rolls from becoming channeled. The shafts of the rolls are made smaller at the bearing points so that they fit easily into the stands provided for them on the frame.

The size of the rolls is also important, and different sizes are used for different reasons. Large front rolls are used mostly on those machines which use a long staple Sea Island cotton, so as to help prevent the fibres from licking up and thus causing damage and loss of production. If the front rolls were of the same size as those used on machines working a shorter staple cotton, the tendency would be for the fibres to curl around the roll because of the smaller diameter, and which they would do very quickly unless prevented by clearers.

Large front rolls are also used to obtain the same production with less speed as compared to a smaller front roll. This arrangement would also help to prevent breakdowns and other damages caused by high speed. Large front rolls are

again used on machines where a high speed is to be run, because being heavier, they will run steadier than small rolls. The diameters of the rolls in the same machine are also made different sizes, that is, the second roll is always made smaller than the front roll. If the second roll was made of the same diameter as the front roll and a short staple cotton was being run, it would be almost impossible to set these two rolls in the proper relation to one another, because they could not be set close enough together without touching each other. It is for this reason that the second rolls, of not only the earlier processes but generally of all processes, are made smaller. While the bottom rolls are important, yet they require less attention than the top rolls, owing to the fact that top rolls are covered with a comparatively easy destructible material.

The top rolls, as their name implies, rest when in position, upon the top of the bottom roll from which they receive their motion, being driven by frictional contact. There are two general types of top rolls, one kind being an iron roll covered with cloth and having an outer covering of leather drawn over this. The second kind of top rolls are those on which flutes are cut. These two types of rolls are entirely different in construction and action.

THE LEATHER COVERED ROLLS

are divided into three different classes, viz: solid or fast boss, shell or loose boss, and "loose end" rolls. The difference in the frictional resistance of these types of leather covered rollers is considerable. It is least in the shell, and most in the fast boss type, the number of frictional points being 1, and 3 or 4 respectively in the two named, and 2 in the "loose end" top roller. The first and last of these are not affected by the manner of attaching the weight, but the fast boss is; there being four frictional points when the weight is suspended from both ends of the rollers, and three when from the middle. The body of the fast boss top roll is made of iron, the boss portion of it being of the largest diameter. The length of the boss is a trifle longer than the fluted portion of the bottom steel roll. The ends of the roll are turned down to a smaller diameter to form necks, which run in bushings on the drawing frame and other preparatory machines, but on fly frames no bushings are used. The top rolls are held in position by the necks running in the upright stands. This iron roll is first covered with a cloth which is glued to the boss of the iron roll, and then a leather cot is pulled over this. The leather for making this cot has been previously selected with regard to the machine on which the top roll is to run and also as to the class of work to be run on that machine. The cloth is also carefully selected as to weight, etc.

THE SHELL ROLL

is constructed in two parts, consisting of a central portion which is a spindle of special shape, tapering gradually from the centre of the spindle to the ends or neck of the rolls. The other part is a shell of iron which fits over the spindle and revolves about it. This shell is covered in the same manner as the solid rolls, that is, with cloth and leather. This roll revolves more easily than the solid roll and does not run in bushings the same as with the solid roll, but the spindle remains stationary while the shell rotates. The spindle should be well oiled, in order to keep the shell part of the roll well lubricated. Shell rolls are used a great deal as front top rolls on account of their easy running qualities, which are produced by the spindle. When shell rolls are used there are a great many more extra shells than spindles, because the spindle in use will answer for the extra shells. The advantages of a shell roll are the easier running, due to the fact that a lighter roll runs on a tapered spindle. This form of roll needs less oil on this account and will run a long while properly if not oiled after the first time of inserting. One disadvantage to the roll is the fact that it is liable to pick up and wind up broken ends, and if dirt and other foreign matter collect around the spindle inside of the shell, it makes it the same as a solid roll without bushings.

(To be continued.)

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

SILK CALCULATIONS.

BY ALFRED CORADI.

A rational method of silk calculating as practised in the every day life of the mill man can undoubtedly best be explained by practical examples.

We will therefore eliminate all abstract rules and schedules as an introduction and begin directly with practical calculations, discussing the various problems as they arise.

Our first proposition is the dissection and calculation of a sample of "Colored Taffeta" 19 inches wide.

The first glance reveals that the weave is a taffeta or plain weave.

Setting the counting glass on the sample we find 45 warp ends in the quarter inch or 180 per inch. Holding the sample against a strong light we are able with the aid of the counting glass to distinguish slight open spaces caused by the dent of the reed. We count 15 such spaces in the quarter inch or 60 per inch and 3 warp ends between each space. This establishes the set beyond a doubt as a 60/3.

Placing the glass again on the sample to count the picks we find 27 in the quarter inch, making 108 picks per inch.

We proceed next to investigate the material. We ravel out first say 20 warp ends and compare them with an equal number of ends of a silk of known size. The best way is to interlink the two bunches of ends and twist them into a cord, both sides equally twisted. Any difference in size can easily be noted in the thus 20 fold magnified thread, and with some experience the correct size very nearly determined.

We have another test in the so-called cocoon proof which is as follows:

Untwisting an organzin thread we find it to consist of two ends twisted together showing that the warp material is a 2-ply organ. Taking one of these threads and spreading it out with a long, finely pointed needle, we are able with the aid of the counting glass to count the cocoon fibres, repeating this operation with about a dozen ends. We find in our sample an average of say 11 1/2 cocoon fibres per thread. To find the number of deniers the rule is to add 25 per cent. to the number of cocoon filaments. 11 1/2 + 2 7/8 (25%) = 14 3/8 or 13/15 denier grege (raw silk).

To translate this into our system of sizing in drams it is necessary to know the relation of the denier to our standards of weight and measurement.

The denier system is the world's standard for numbering raw silk.

The authentic standard for this country recognized by the New York as well as London silk conditioning houses and extensively used in France, is the so-called "Old Lyons" denier.

The standard of length is a skein of 400 French ells (aunes) or 400 turns on a swift of one French ell circumference. Translated into metric measurement the swift measures 119 centimeters, 400 turns being equal to 476 meters, or in our standard aggregating to 520.56 yards. The weight unit called denier is an exceedingly small weight equal to 0.05311 grams in metric standard, or in our weight about 4/5 of a grain (0,8196) or 3/100 of a dram (0.02997). The size number indicates the number of deniers in the weight of a skein of 400 French ells = 476 meters = 520.56 yards. For instance, a 13/15 denier raw silk means that 1 skein 520.56 yards long weighs from 13 to 15 deniers. Besides the old Lyons denier there are in use in Europe:

The "Old Turin" denier. Length of hank 476 meters, weight unit 0.05333 grams, used principally for cheaper grades Italian silk for tram purposes.

The "Titolo Legale" or Italian system. Length of hank 450 meters, weight unit 0.050 grams. Was established after introduction of the metric system in Europe to better conform to that system and facilitate figuring. Is now acknowledged standard in disputed cases before courts.

The "Titolo Internationale." Length of hank 500 meters, weight unit 0.050 grams. Was established and ratified in International Congress in Vienna and Brussels; has, however, never found a large following.

The "Old Milan" denier. Length of skein 476 meters, weight unit 0.0511 grams. Used in Europe largely for Italian silks, principally for organzin.

Summing up we are only interested in the relative value of all other deniers to the Lyons denier which is as follows:

100 Lyons denier = 100.419 Titolo legale
100 Lyons denier = 104.134 old Milan den.
100 Lyons denier = 99.532 old Turin den.
100 Lyons denier = 111.576 Titolo internationale.

The American as well as English method of indicating the size of silk after being thrown is by the simple system of drams. Length of skein, 1,000 yards; weight unit, 1 dram. The number of drams 1 skein of 1,000 yards weighs, indicates the size of the silk. For example, a 1 3/4 dram organzin means that a length of 1,000 yards weighs 1 3/4 drams.

If 1,000 yards weighs 1 dram, 520.56 yards will weigh 17.366 deniers. Consequently 1 by the dram system is equivalent to 17.366 by the denier system of numbering silk. This is the key to all reductions from denier to dram, or vice versa. Any size silk in drams multiplied by 17.366 gives its equivalent in deniers, or any size given in deniers divided by 17.366 gives the equivalent in drams, for practical purposes 17 1/3 or 17.3 is sufficiently exact.

Ex. An organ 2 ply runs 1 65/100 drams, what sized raw silk is it made of? 1.65 × 17.366 = 28.65 deniers for the 2 ply thread or 14.32 deniers for the single thread equal to a 13/15 denier raw silk.

Ex. A 14/16 denier raw silk (average 15 deniers) is thrown into a 4 thread tram, what size should the silk in drams be after being thrown? 15 deniers, 4 ends = 60 deniers; 60 (drams) ÷ 17.366 = 3.45 drams.

This, of course, does not take into account any addition of soap or other ingredients from the throwing process, and if there is any considerable discrepancy between the report of the conditioning house and the returns from the throwsters, according to above figures it is an evident proof that the silk has been unduly treated. A slight allowance only has to be made for the shrinkage or take-up in the twisting process and consequent increase in volume and proportionate weight. In slack twists, as used for tram, this take-up is so slight as to have no bearing whatever on the result and in regular organzin it does not amount to more than 1 1/2 per cent.

Returning to our sample we have yet to establish the material used for the tram. We proceed as with the organzin test, either by comparison with known materials or by cocoon proof.

On account of the slack twist it is quite difficult to distinguish how many grege ends are in the tram. We note by comparison, however, that the whole tram thread is equal to about 3 1/2 drams or 60 deniers, and from this we draw the conclusion that it is a 4 thread tram of 14/16 denier, as we know by experience that this is the material most commonly used for tram.

All that remains to be done to complete the analysis of our sample is to establish the dye and weighting of the silk and select an approximately equivalent grade of raw silk. We have no means of ascertaining just how much the silk is weighted and must be guided in this respect solely by precedents, general appearance and touch.

We can, however, find out if a silk is weighted at all, or if it is a pure dye by the burning test. If we apply a match to a sample the pure dye will extinguish the

flame at once, the ashes curl up, leaving a black, crisp and compact mass. A weighted silk will slowly continue to glow; the ashes are light and fall into dust at the slightest touch. Applying this test to our sample we find that both organzin and tram are weighted and we estimate the amount as follows:

Organzin bright, 16/18 ounces.
Tram bright, 22/24 ounces.

i. e. 16 oz. raw organ should return 16-18 oz. dyed; 16 oz. raw tram should return 22-24 oz. dyed.

The grade of raw material we estimate to be:

For organzin, Japan filature best No. 1, 13/15 den.

For tram, Japan rereel No. 1-1 1/2, 14/16 den.

We will now give the full calculation and let the explanation of the different items follow.

The rates for raw materials are understood to be for thrown silk, doing away with the separate operation of figuring out the throwing charges.

Style: — Colored Taffeta.
Width: — 19 inches.
Reed: — 60/3.
Warp Ends: — 3400/1 ground, 2 × 18/2 edges } 3472
Width in Reed: — 19⅛ inches.
Picks: — 108 per inch, 1 end.
Warp: — Japan organzine, 2 thread, $1\frac{65}{100}$ drams. Bright $\frac{16}{18}$ ounces.
Filling: — Japan tram, 4 thread, $3\frac{50}{100}$ drams. Bright, 22/24 ounces.
Waste: — Organzine, 4 %. Tram, 6 %.
Length of Warp: — 109 yards.
Length of Cloth: — 100 yards.

Organ: —

$$\frac{3472 \times 109 \times 1.65 \times 104 \times 1}{1000 \times 100 \times 256} = 2\tfrac{44}{100} \text{ lbs. @ } \$5.00 \ldots\ldots \$12.70$$

Tram: —

$$\frac{108 \times 19.12 \times 100 \times 3.5 \times 106}{1000 \times 256} = 3 \text{ lbs. @ } \$4.35 \ldots\ldots 13.05$$

Dyeing: —
Organ: $2\frac{44}{100}$ lbs. @ 60c. per lb. 1.52
Tram: 3 lbs. @ $1.05 per lb. 3.15
Winding: —
Organ: $2\frac{44}{100}$ lbs. @ 12c. per lb. ..... .30
Tram: 3 lbs. @ 10c. per yard ..... .30
Milling: —
Tram: 3 lbs. @ 10c. per yard ..... .30
Warping: —
100 ends, 2½c. per 100 yards ..... .95
Twisting: —
1000 ends, 25c. basis, 300 yard warps ..... .29
Weaving: —
@ 6c. per yard 6.00
Picking: —
@ ½c. per yard ..... .50
Finishing: —
@ 1c. per yard 1.00
Harness: —
$2.00 per 1000 heddles, basis 5000 yards ..... .14
Mill Expenses: —
2/3 of weaving steel harness 4.00
Net mill per 100 yards 44.20
Assumed net profit 2.80
47.00
Selling Expenses: —
15% (divided by 85) 8.30
Total, $55.30
or *Selling Price per yard, 55 cents.*

The method of calculating the weight of the warp is thus explained: We have 3,472 ends in the warp 109 yards long=378,448 yards of organize, or 378.488 lengths of 1,000 yards each. The silk weighs 1.65 drams per 1,000 yards, therefore,

378.448 × 1.65 = 624.44 drams.
Waste, 4 % ..... 24.98 drams.
Total, 649.42 drams.

We require, therefore, 649.42 drams or 2.54 lbs.

We can invariably shorten the calculation by cancelling the common divisors. In this particular case as follows:

$$\frac{217 \times 109 \times 1.65 \times 13}{1000 \times 100 \times 2} = 2.54 \text{ lbs.}$$

The calculation of the weight of the tram is explained as follows:

108 (picks) × 19.12 (inches) × 100 = 206,496 yards
206.496 (10,000-yd. lengths) × 3.5 (drams per 1,000 yds) = 722.74 drams.
Waste, 6 % ..... 43.36 drams
Total, 766.10 drams,
or 3 pounds tram.

Dyeing: The rates are self explanatory, being per pound of raw weight according to dyers' price list.

Winding: Even where the cost of soft silk winding is paid by the piece from the dyed weights, it is convenient for the calculator to compile a table of the equivalent prices for raw weight, as it saves the time of figuring out the dyed weights for every calculation.

Quilling: Knowing the number of and

production of the looms a quill winder is able to supply, the cost of quilling can easily be ascertained. For single end filling the calculator will find that it will not greatly vary from the cost of winding.

Twisting: The rates are per 1,000 ends. Consequently the longer the warp, the cheaper the twisting.

Weaving, Picking, Finishing: The rates are figured per yard.

Warping: The rates are generally fixed per 100 ends 100 yards long. For large dye lots, of which a number of warps can be made with a full set of spools, a lower rate can be made than for one-warp dye lots.

Harness: The calculations are based on the movable steel heddle so extensively introduced in recent years despite its apparent expensiveness. We figure $2.00 per 1,000 heddles and estimate they will last for 5,000 yards. Comparing this with the older style of French cotton heddle at 80 cents per 1,000 eyes we do not find any perceptible difference in cost.

We must, however, take into consideration that a cotton harness is made for a specified count, and can not be used for anything else, when therefore looms have to be changed to a different quality it means the installation of a new set of harness, though only one or two warps may have run through the old ones. We know by experience that laying on shelves is almost as detrimental to cotton harness as actual use. The steel harness can be changed to almost any count our orders may call for, thus doing away entirely with the accumulation of an idle harness stock and getting the full benefit of the superior lasting qualities. Furthermore a cotton harness, if not very carefully handled and turned regularly is liable to break down before 2,000 yards are woven, while steel harness may last for 10,000 or even 20,000 yards.

Mill Expenses: Under this item we have to place an adequate portion of the fixed expenses in our calculation such as:

1. Maintenance of buildings, boilers and engine; interest on building account or rents.
2. Power and light.
3. Salaries.
4. Mill supplies and machinery repairs.
5. Office expenses.
6. Express and freight charges.
7. Taxes and insurance.
8. Interest on active capital.
9. Depreciation of machinery and fixtures.

It is self evident that the general expenses should be apportioned, not according to the value per yard, but in proportion to the time required to produce a yard. When, for instance, a plant is organized for 200 looms, and its annual fixed expenses aggregate about $24,000, the amount will not differ greatly whether the mill turns out 600,000 yards or only 400,000 yards per year. The bearing on the cost calculation is, however, as follows:

Production: 600,000 yards. Expenses: $24,000 = 4c. per yard.

Production: 400,000 yards. Expenses: $24,000 = 6c. per yard; a difference of two cents per yard, which amounts on 600,000 yards to $12,000 a year. This item is the essence of the whole calculation. A sagacious manager will run ahead of his estimate and a loosely managed concern will see its paper profits shrink in an inexplicable manner. The practise to apportion 10 or 12 per cent. of the net cost is, therefore, in many instances erroneous and misleading. We will illustrate this in a later example.

A very simple way to figure mill expenses in fair proportion is the following:

Since we have shown that this item is altogether dependent on production, we bring it in relation to the rate for weaving which is based on exactly the same principles. High production fabrics will pay a lower rate; low production goods a higher rate; no matter how little silk there may be in the latter.

With a conservative estimate of the average production allowing for eventual forced curtailment or temporary stoppage, we can establish an average rate per yard.

In our case we assume that four cents on every yard turned out would cover our expenses. Comparing this with the rate for weaving of medium producing qualities which we assume to run about six cents per

yard, we decide our standard for mill expenses to be two-thirds of the rate of weaving. Weaving: For 100 yards equals six dollars; mill expenses: two-thirds of above equals four dollars. Should we calculate a quality costing nine cents for weaving, our mill expenses would be six cents per yard, etc.

Selling Expenses: These comprise the commission to selling agents and customary cash discounts if goods are sold through a commission house. Even where goods are sold direct a separate account is carried for the selling end, so that a percentage per yard can easily be established. The calculator must figure the percentage from the selling price.

In our example

100 yards net will cost	$44.20
If we should add 15% to this	6.63
Would mean net selling	$50.83
Assuming net profit	3.17
Selling price for 100 yards	$54.00

or per yard 54 cents. This is incorrect because the selling agent will figure as follows:

Selling price	$54.00
Less 15% commission and discount	8.10
Leaves mill	$45.90
Less net cost	44.20
Leaves net profit	$1.70

(To be continued.)

LENO CLOTHS.

BY WILL NELSON.
(Head Instructor in Warp Preparation and Weaving, Lowell Textile School.)

(Continued from January.)

Fig. 18 shows the third order of leno cloths, and it has been made for the special purpose of showing the three distinct kinds in one piece of cloth, so that they might be more readily distinguished. The stripe marked A is a net leno, B a lace or hemstitch, C a full turn leno.

We classify leno cloths under these three heads, so as to simplify the language, and make the meaning clearer when speaking of a leno cloth, especially if the cloth is not in evidence; for example, a cloth is required formed by a net leno stripe and a five-end satin warp-stripe; 8 ends of 2/10s cotton yarn to be used for leno, with 4 ground threads under each crossing thread, each ground thread to be made up of 2 1/40s cotton yarn; a pronounced diamond effect required; the satin stripe to be made with 60 1/40s cotton yarn. Such a cloth is shown in Fig. 19.

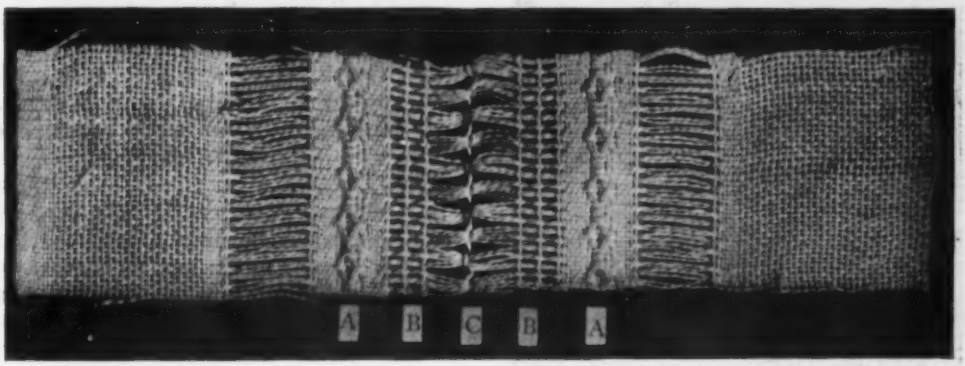


FIG. 18.

A net leno cloth is any leno stripe that has the crossing threads of a heavier count than the ground threads, also showing more prominent on one side of the cloth than the other.

Stripe B, Fig. 18, is a lace or hemstitch leno; this is distinguished from A by having the ground and crossing threads of the same counts and in that stripe both sides of the cloth are exactly the same.

All cloths of the same order, whether they have a change in the number of picks or not, would be classed as lace or hemstitch leno. An example of this is shown in Fig. 20, it being impossible to tell which thread passed through the doup, and both sides of the cloth are practically the same.

The stripe at B and Fig. 20 is often called a full leno; stripe A and Fig. 19, a half leno;

FIG. 19.

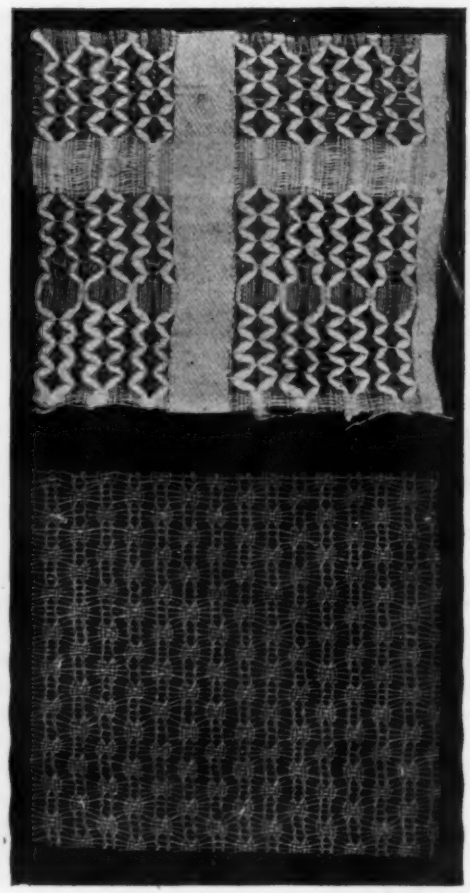


FIG. 20.

and to the uninitiated it would appear that such is the case, but it is not so; it is very difficult to impress the novice with the fact that absolutely the same movement is required on the doup and standard in both cases, the picks between the change of doup and standard along with the counts of yarn used making the difference in the pattern. A close scrutiny of the stripes, along with the explanation in Article I will very readily show this.

In the net stripe Fig. 18, the crossing thread on the outside is to the right of the ground threads when the point of the diamond is formed; this is done by dropping the doup and standard for one pick; for the next pick they are both lifted keeping the cord on the face; for the third pick the doup and crossing thread harness are lowered, which carries the cord thread to the left of the ground thread; and for the next seven picks the cord is kept on the left side, simply by dropping the doup and not the standard and on alternate picks; this is the order of working when a top doup is used.

In stripe B, which was made with a bottom doup the doup and crossing thread harnesses are raised for two picks, which shows the crossing thread to the right of the ground thread; to get the crossing to the left of the ground thread the standard and doup are raised, the only difference being that there are no picks inserted before the change is made. Knowing this we see no reason why one should be called a full leno and the other a half leno. Moreover, there is such a stripe as a full leno or full turn leno, which is made in a somewhat different manner to the others; stripe C. Fig. 18, shows the full turn. It will be noticed that the white is always to the right of the blue thread, even though it may be underneath the filling, and that after five picks have been woven with the thread raised on the right side, it makes a complete turn around the blue before it comes to the right side; but the blue is then raised for five picks, the white again being pulled back for a complete turn to be lifted on the right of the blue. This form of leno makes a very rich effect for curtain goods and certain classes of dress goods, which are used to obtain the same effect as grenadine.

Fig. 21 shows how such a leno can be made; three harness only are required, the standard being dispensed with and the ordinary doup thread passing through a glass bead or small brass ring; this is to prevent the doup from working through the reed.

The doup must also be lifted higher than usual, because the crossing thread has to be pulled completely around the ground thread. To obtain this excess movement a bell crank lever is used with the harness strap connected to the longest end, and the harness lever to the shorter end. The easing rod ought to slacken off more than with the ordinary leno.

In addition to dispensing with the standard harness, there is also another peculiarity in the construction of this leno. The crossing thread harness never rises. Fig. 21 shows the shed caused by the lifting of the ground thread, also indicates the position of the harness when the doups are tied in. The ground harness is raised, the crossing thread harness being left down. The bead or ring is then placed on the crossing thread and the end tied. The doup yarn is passed through the bead drawn over the top of the ground thread, underneath the crossing thread and up to the doup harness shaft where it is tied. Often a rod the size of the shed is passed through the ends, the rod keeping them an equal distance apart.

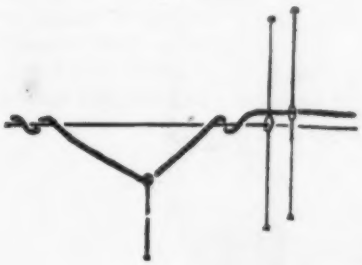


FIG. 21.

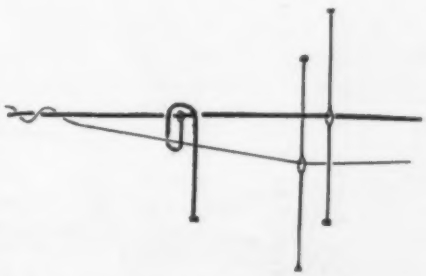


FIG. 22.

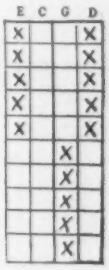


FIG. 23.

E.—Easer. *C.*—Crossing. *G.*—Ground. *D.*—Doup.

This ensures all the doups being made of equal length. Five picks of filling are passed through the shed formed by Fig. 21.

For the next change the ground and crossing thread harness are both down and the doup shaft raised by means of the bell crank lever, Fig. 22. The raising of the ground thread harness and the dropping of the doup will force the ends and doup to assume the position shown in Fig. 21.

Fig. 23 is the pegging plan for this formation. The picks are varied to give different

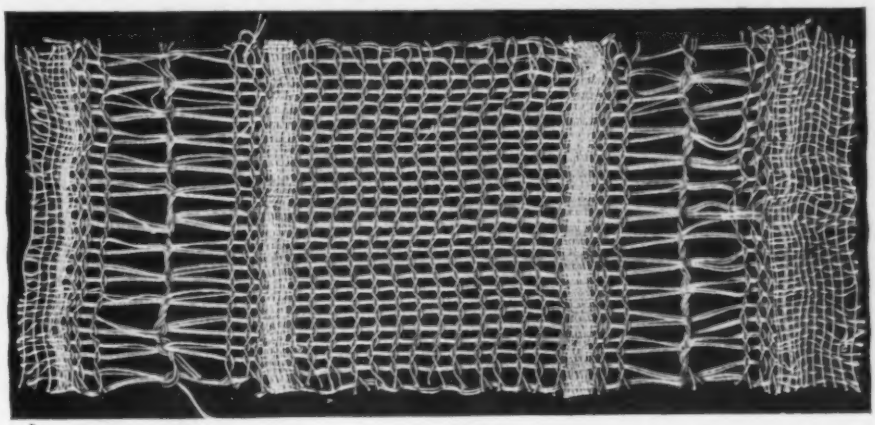


FIG. 24.

effects. Fig. 24 clearly shows the difference in the working of the threads to form a lace leno and a full turn leno.

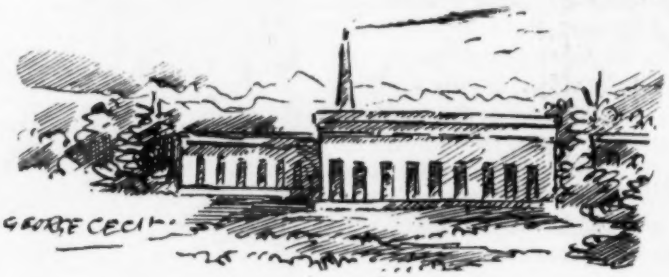
(To be continued.)

THE INDIAN TEXTILE WORKER.

BY GEORGE CECIL.

(In The Textile Mercury.)

Briefly, the work of the native employee does not differ materially from that of the stay-at-home English cotton mill operatives.



THE "UP-COUNTRY" COTTON MILL.

The Aryan workman, however, is a marked posite of those associated with the Lancashire cotton man. Consequently the manager, spinning master and engineer, cannot repose in their subordinates that trust and confidence that is possible in England, Mexico, Russia, France and other cotton manufacturing countries, for the dusky opercontrast to his white confrere. His characteristics and habits are almost the exact opative if left to his own devices is apt to err. His fingers will become mixed up with the most dangerous parts of the machinery, and his limbs will get entangled with the belting. If not watched more or less incessantly he will be idle; being naturally careless he may, by neglecting instructions, bring about a catastrophe. If employed in the engine room he is apt to slumber when he should be watching the temperature of the bearings, while the Aryan whose business it is to replenish the reservoir of the sight-feed lubricators and oilers is prone to omit that necessary duty. The brown man who is told off to grease the driving belts and keep an eye to the rope alley is very liable to fail in these important duties. It will thus be seen that, though the Mahometan and Hindu mill men know their work, they cannot be wholly trusted to carry it out. Consequently "master's eye" must be everywhere; in other words the manager and his staff find it necessary to keep a sharp lookout on the doings of those under them.

The day's labors commence early in the morning, when each operative's name is checked by the "durwan" (gate-keeper). The native holding this position of trust is thought to be an honest person, and with a view to securing suitable men for the post pensioned "sepoys" are sometimes selected. The manager possessing a "durwan" of this

THE NATIVE OPERATIVE.

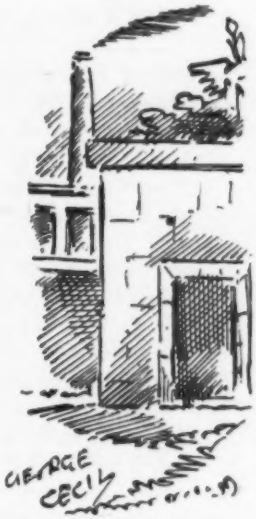
description can make fairly certain that he is employing an honest man, for should a "pin-

sin-wallah" (pensioner) be convicted of theft he forfeits his Government pension.

Thus they find it advisable to refrain from

THE EX-SEPOY DURWAN.

helping themselves to the mill stores, or from passing over hidden nails, screws, and "brasses," when searching the outgoing operatives. It may, by the way, be added that



THE DURWAN'S DWELLING.

every native is searched on leaving the mill premises at night, the duty of examination being allotted to the gate-keeper. Should he be dishonest he is afforded unique opportunities of enriching himself in a highly illegal manner. Sometimes he avails himself of these chances. "Brasses," it should be borne in mind, are a strong temptation to the native.

Many a dusky mechanic will rob the bearings entrusted to his care of their adjuncts, running the chance of being detected. Should he "square" the "durwan" by offering him a share of the proceeds he will, quite possibly, be allowed to smuggle his booty past the gates. Should he succeed in doing so he will dispose of it to the local receiver of stolen property. Lumps of coal he is also given to carrying off, and several native operatives have been detected in making away with a rope. This they coil around their

THE FEMALE OPERATIVE.

dusky bodies. Needless to say, on being detected by the managerial powers that be, just retribution follows—and the recipient of justice is unable to sit down for a week.

The ex-sepoy "durwan" is, usually speaking, a fine looking man of imposing physique; tall and well set up, he commands attention. His dress consists of a short linen undervest, a shirt, a voluminous turban, and a pair of pyjama-like garments; a pair of sandals and his medals—gained in conflicts with hill tribes—complete his attire. In the "cold weather" he wears a blue or chocolate colored coat entitled a "chupkun," a thick blanket being added when he is on night duty.

In contrast to the native of the above description the Aryan operative is frequently

a miserable looking creature. Often round-shouldered, wizened-faced, of no stamina, ill featured and stunted, he is by no means a pleasant object on which to gaze.

His wife, who also works in the mill, is, if anything, even a less pleasing person. At thirty the native woman is wrinkled; at forty she is yet more unlovely. In the matter of costume, she wears a species of elongated kilt of colored material, and a "saree" (shawl) over her shoulders. Her children, who, when old enough, assist at the looms, wear a rag around the waist if they happen to be boys, and a modified version of the mother's costume if they are girls. The men are clothed much like the "durwans," the turban sometimes being exchanged for a piece of filthy rag; more often no head gear of any description is worn.

THE NATIVE WHO WRITES LETTERS.

Should the Oriental operative employed in a mill desire a holiday he will cause to be written, by an English-speaking native, a letter setting forth that he is too ill to be present at his work. The effusion in question will be despatched to the manager, and the sender will go to sleep. He has occasionally been known to enlist the services of a native doctor, who, for a consideration, will furnish him with a certificate to the effect that he is suffering from fever—a very prevalent (and convenient) ailment in India. Since the phraseology employed may interest the reader, copies of such letters are given:

Serampore, May 2, '00.

To the Manager ——— Mill.

Honorable Sir,—This poor one is suffering from severe fevers with accompaniments of vomiting so he prays your honor to excuse him that he may quick get well his pulse beats high and he cannot do any works nor is he eating if your honor will excuse him til such times as he will be better he will as in duty bound ever pray for your honor's goodness etc.—Your humble

BENI PERSHAD Cotton Man.

This is to certify that Ram Singh is a suffering from much fever. He is also very unwell and in my medical opinion cannot do any works at all today. Tomorrow God willing he will be well. Otherwise he will not. I have administered all the needful. I advise complete change of rest and quiet. The poor fellow is very ill I think.

LAL SINGH, Doctor.

Nagpore, C. P., May 15, 1900.

It is worth noting that the Indian cotton-mill operative has been known to mutiny against the manager and his staff. On being brought to book he lies freely, and produces a number of (paid) witnesses who assist him in protesting his innocence. Should the witnesses forget the story they have undertaken to relate it will go ill with them on the prisoner regaining his liberty.

REINDEER WOOL.

The U. S. Consul at Frankfort, Germany, sends some interesting information concerning the use of reindeer hair or wool. He says that from time immemorial the Laplanders have known how to manufacture coarse but warm blankets from the wooly hair of the reindeer. These are an excellent protection against moisture and frost. The inhabitants of Sweden and Norway were the first to observe how well the reindeer swims across large bodies of water. This led to the thought that there must be something in the animal's hair suitable to the making of useful textiles. This, in turn, then led to the manufacture of fabrics which are used mainly for protecting the body when the wearer goes out on the sea in winter.

A close examination of the hair of the reindeer furnishes an explanation of its peculiar value. The hair does not have a

hollow inside space for its whole length, but is divided or partitioned off into exceedingly numerous cells like water-tight compartments. These are filled with condensed air and their walls are so elastic and at the same time of such strong resistance that they are not broken up either during the process of manufacture or by swelling when wet. The cells expand in water, and thus it happens that a man clad completely in garments made of reindeer wool does not sink when in water, because he is buoyed up by means of the air contained in the hundreds of thousands of hair cells.

In the markets and stores of Norway, Sweden, and Russia garments and blankets of reindeer wool are to be had at lower prices than other fabrics.

In Vienna there is a factory which manufactures garments of reindeer wool, especially bathing costumes. For persons unable to swim the possession of such garments is of great value. It is possible that they may be utilized in learning how to swim. Recently successful trials have been made in Paris in this line.

BLEACHING RAW COTTON.

I have lately been investigating the comparative advantages of bleaching cotton in the raw state and in the form of yarn. I find that in one large mill they pay 17 cents per thousand yards of 378 ends for quilling chain dyed filling, 20's single yarn. That would make a cost for labor alone of nearly $0.008 per pound. Adding to this the cost of oversight and miscellaneous expenses the cost of quilling 20's single yarn will be very near 1 cent per pound, and if to this is added the cost of chain warping and spooling you will have a labor cost of 1 1/2 cents per pound or more. This expense would be avoided if the filling was spun from the bleached or colored cotton, as these operations would not be necessary.

I have drawn up a few figures for cost by the different methods. The first is the approximate cost where the yarn is bleached in the chain and quilled afterward. These costs are very close, but not strictly accurate for 20's yarn as it is run here, our cost being about $0.225.

Carding	$0.0075
Spinning	.007
Spooling	.005
Ball warping	.003
Chain quilling	.008
Total	$0.0305

Now let us suppose that we bleach in the raw stock and spin our filling, allowing 33 per cent. or more for the increased cost of carding the bleached stock, and that the labor cost of bleaching will be more, although I believe a plant could be arranged so the cost of bleaching stock would not be more than bleaching the yarn. Then for the stock we would have, say, the following:

Carding	$0.01
Spinning	.008
Bleaching	.005
Total	$0.023

This gives a saving in favor of the stock of $0.0075, and to my mind this in one reason why this method of working is becoming popular.

As for waste, there would be about 2 per cent. of thread waste which would tend to offset the waste made when bleaching the stock.

It will be noted that even after allowing for extra expense in carding and spinning the stock, there still remains a good margin in its favor. I understand that in one of our largest mills stock is colored for both warp and filling for all numbers up to 40's.

ROGER WILLIAMS.

The patent for the first of all power looms was taken out in 1785 by Edmund Cartwright.

To encourage manufacturing in Great Britain letters-patent were granted in 1565 to "therty Douchemen of the Lowe Countrys" to settle at Norwich and engage in the manufacture of such "outlandish commodities as hath not bene used to be made within this our realm of England."

ESTIMATING THE COST OF WOOLEN GOODS.

The merchant who acts only as a distributor of goods has no difficulty in determining the cost of his wares. The invoices tell him in plain figures the cost of the merchandise, which, undergoing no change while in his possession, is sold in the same condition as when purchased, with a certainty as to the profit or loss of any transaction.

The manufacturer on the contrary has to face a far different condition. If he is manufacturing woolen goods, he must invest in raw material in the form of wool as it comes from the sheep's back, in raw cotton, shoddy, waste, fuel, oil, soap, dyestuffs and chemicals, machinery, belting and other supplies. He pays out large sums for labor and in return for this outlay finds in his possession a stock of manufactured woolens of various grades and market values. No clue as to their cost per yard can be obtained from the pay roll, or invoices of material and supplies. What

Monthly Statement of a 12-set Mill on Dress Goods. 36" wide 36 picks

Dept.	Product	Labor	Expense	Average Labor	Average Expense
Sorting	74,765 lbs	299.06		.004	
Scouring	29,906 "	101.68		.0034	
Coloring	29,906 "	221.30	852.32	.0074	.0285
Picking	29,906 "	59.81	86.73	.002	.0029
Carding	148,500 rms	519.75	133.65	.0035	.0009
Spinning	148,500 "	772.20	29.70	.0052	.0002
Spool & Dress	6187 lbs	346.50	13.61	.056	.002
Weave. Day	74,250 yds	534.60	51.98	.0072	.0007
Weave. Piece	74,250 "	1752.30		.0236	
Finishing	74,250 "	816.75	185.62	.011	.0025
Repairs	74,250 "	155.92	51.98	.0021	.0007
Dye & Tapes	74,250.		371.25		.005
Fuel	74,250.	80.19	348.98	.001	.0047
Freight etc	74,250.		133.65		.0018
General	74,250.	482.67	155.92	.0065	.0021
		6142.68	2415.39		

Dividing the labor cost ($6142.68) by the yardage for the month (74,250 yds) gives us .08 27/100, the average labor cost per yard. Dividing the expense cost ($2415.39) by the yardage (74,250) gives .03 25/100 as the average expense cost per yard — the total for labor and expense being 11 52/100 cents per yard.

FIG. I.

the goods cost per yard, how much for raw material, for labor, and for all other expenses are questions that must be met, and upon the accuracy of the answer may depend the success or failure of the business. If the manufacturer relies on guess work or inaccurate methods of estimating, he may be selling his goods at a loss or holding them at a figure so high as to prohibit their sale. He will then occupy the position of a merchant who ignores the cost in fixing the selling price of his goods. The ultimate result of a business so conducted cannot be a matter of doubt.

It is necessary to compile statistics of mill work, showing the product obtained from

Monthly Statement of Fixed Charges of a 12-set woolen mill on Dress Goods 36" wide, 36 picks

74250 yds. 36 inch goods, 36 picks = 26730 yds. 4/4, 50 picks

Dept.	Product	Labor	Expense	Average per yd. 50 picks Labor	Expense
Weaving	26730 yds	534.60	51.98	.02	.002
Repairs	"	155.92	51.98	.006	.002
Int. & Taper	"		371.25		.014
Fuel	"	80.19	348.98	.003	.013
Freight	"		132.65		.005
General	"	482.62	156.92	.018	.006
		1253.33	1113.76	.047	.042

FIG. 2.

It is of the utmost importance to each manufacturer, not only to estimate closely the cost of his own goods, but that all of his competitors should be able to do the same, for the manufacturer who sells his goods in ignorance of their cost, not only ruins himself, but spreads demoralization in the trade and causes loss to all other manufacturers in the same line. However much manufacturers may try to keep the knowledge of their machinery, processes and fabrics from their competitors, the possession by every mill of the best method of determining the cost of goods per yard is of benefit to all.

To make this article of use to the greatest number of our readers, it will be necessary to avoid a detailed account of the cost of any one class of goods, or of any one branch of manufacture, and confine it to as clear a statement as possible of the general principles, leaving to each mill owner the work of applying them to his particular requirements.

The cost of material per yard can be more readily determined than the cost of labor and expense, as only three factors are to be reckoned with in the cost of the stock, viz.: cost of raw material per pound, the percentage of shrinkage in manufacture, and the value of the waste products. The fluctuations in the amount of a mill's production do not affect the cost of raw material.

material supplied to each department of the mill, such as the various quantities of each sort obtained from wool purchased, weight of scoured or colored stock from materials supplied to scouring and dyehouse, the yarn obtained from picked stock and the quantity of finished cloth produced from goods as they come from the looms. From such records the cost of the raw material in any one of our fabrics is readily calculated.

In a mill making but one fabric the labor and expense per yard can be found by dividing the total amount of pay roll and expense charges for any given period, by the number of yards manufactured during that time. Such a calculation, however, in a mill making two or more fabrics would give only the average cost of all the goods, and would aid but little in forming an estimate of the cost of any one fabric. The great variety of goods, varying

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Finishing	74.250 "	816.75	185.62	.011	.0025
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It is necessary to compile statistics of mill work, showing the product obtained from material supplied to each department of the mill, such as the various quantities of each sort obtained from wool purchased, weight of scoured or colored stock from materials supplied to scouring and dyehouse, the yarn obtained from picked stock and the quantity of finished cloth produced from goods as they come from the looms. From such records the cost of the raw material in any one of our fabrics is readily calculated.

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Freight	"		132.65		.005
General	"	482.62	156.92	.018	.006
		1253.33	1113.76	.047	.042

FIG. 2.

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in quality, weight, size of yarn, number of threads per inch, and in finish, made in the same mill, complicates the calculation of the cost of labor and expense of one fabric. A mill may have several classes of goods in process at one time, some requiring careful sorting of the raw material, while others are made from stock as it is received; some stock

Cost Estimate of Woolen Cassimere.

15½ oz. per yd. 4/4

2800 ends, 8½ runs; 68" wide in loom. 50 pks. 3 ozs. run

Stock shrinks 10% from clear wool to yarn.

15% " yarn to finished goods.

21 7/10 oz. stock required for yard, 424 lb; .562 cost of stock.

	Required per cent	Manufacturing Average Labor	Expense	Cost per cent Labor	Expense
Sorting	156 lbs	.004		.62	
Scouring	63 "	.0034		.21	
Coloring	63 "	.007	.03	.44	1.89
Picking	63 "	.002	.003	.13	.19
Card. & Spin.	221 "	.01	.001	2.21	.22
Spool. & Dres.	7 sec.	.056		.39	
Weaving Pc.	50 yds	.089		4.45	
Finishing	47 "	.036	.023	1.69	1.08
Fixed	50 "	.049	.042	2.35	2.10
				12.49	5.48

	Cost Stock per yd	.562
1249 / 477 yds	" Labor " "	.266
	" Expense " "	.116
5.48 / 477	Mill cost per 4/4 yd	.944

FIG. 3.

dyed, others piece dyed. Under such conditions a system must be adopted that will apportion to each grade the expense which its manufacture entails.

To do this we must first learn the cost of each process. This can be done only from records of each department, carefully collected during a period of at least six months, when such department was operated to its full capacity. These statistics are the basis of all our calculations. They not only furnish us with the facts on which we base the cost of each of our various fabrics, but also with a clear statement of the work in different departments of the mill. They should be compiled monthly, and these monthly reports will prove very valuable to the manager of a mill, showing him at a glance whether the department is doing its work at a greater or less cost than in former months, and indicating the effect of any change in machinery, help or methods. A form for such a monthly statement will be found at Fig. 1.

Each department has its own unit of production, such as the pound of stock for the dyehouse, the run of 1,600 yards of yarn for carding and spinning, the yard for weaving, etc. The average cost for each department is found by dividing the total cost by the production.

The fixed charges, such as fuel, freight, insurance, taxes, etc., must necessarily be averaged on some arbitrary plan. The department of the mill with the lowest capacity of production measures the production of that mill, and the production of that department is used as a basis for calculating the average cost of fixed charges. As yarn can be and generally is, purchased to keep the looms running full, the weaving department in most cases serves well as a basis for calculating fixed charges. As the goods vary widely in the number of picks per inch and consequently in yards produced, this weaving product must be reduced to an equivalent yardage with a constant number of picks per inch. Assume that we have adopted 50 picks as a basis, and the product in a given month is, say, 10,000 yards, averaging 40 picks per inch. The equivalent of this product in 50 pick goods would be 8,000 yards. If in another month the product should be 5,000 yards, averaging 80 picks per inch, the equivalent would again be 8,000 yards of 50 pick work. This reduction of the yardage makes the report much more valuable for comparing the operations of the mill during different periods.

When estimating the cost of any particular grade, we must figure the cost of each process through which the fabric passes, and a method which has been found both simple and efficient consists in calculating the quantity of material which must pass through each of the necessary processes to produce one cut of the goods. For instance, we find that a cut of cloth which measures 45 yards finished, may require 200 pounds of wool to be sorted, 70 pounds of clean wool to be colored, 100 pounds of stock to be picked, 250 runs of yarn to be spun, 55 yards of warp to be dressed, and 50 yards of cloth to be woven and finished. Each of these items is extended at the average cost of the process, fixed charges being calculated per woven yard. The sum total of these items divided by the 45 yards of finished cloth per cut will give the estimated cost per yard of that fabric for labor and expense. If the cloth is made with a greater or less number of picks than 50, the average used for fixed charges is increased or diminished in corresponding proportion.

There is but one proof of the accuracy of any cost estimate. When an inventory is taken and mill accounts closed, the yardage of the various fabrics should be extended at their estimated cost, and the sum total compared with actual cost as shown by the counts.

Fig. 2 is a statement of the cost for fixed charges as indicated by Fig. 1, but reduced to a basis of 50 picks. The actual monthly production was 74,250 yards, 36 inches wide, 36 picks. As the goods were woven two widths in the loom the yardage was one-half this amount or 37,125 yards, 36 picks per inch. Assuming these looms to have operated with the same efficiency on a cloth having 50 instead of 36 picks per inch, a proportionately less yardage would result. A simple calculation gives 26,730 yards of 50 pick goods as the equivalent. This reduction is made for the purpose of having a standard of production by which to calculate the average cost per yard of the so-called fixed charges, and by which to compare the product of different months. One yard of goods containing 50 picks per inch is taken as the yard stick by which we measure the work of the mill and determine the efficiency of its operation.

Two important items of cost, interest and depreciation, do not appear in our statement, and have been omitted because they vary so widely among different mills. Care should be taken to allow for them in estimating the cost of goods.

Fig. 3 illustrates the method of estimating the cost of a particular fabric. This estimate was based upon the averages obtained from Figs. 1 and 2. The different items of cost are first placed in the left hand column; in the next column appears opposite each item the material or work required for one cut. In the next two columns are the cost averages for labor and expense. The total cost per cut for each process is then extended and placed in the columns at the right. These items are then added and the totals taken as the estimated cost of labor and expense per cut.

The average cost per yard is found by

dividing the total cost of raw stock, labor and expense by the finished yards per cut. These three items are in turn added and the result is the estimated mill cost of the fabric per yard.

THE AIX-LA-CHAPELLE TEXTILE SCHOOL.

The Higher Textile School of Aix-la-Chapelle is divided into four departments —Spinning, Weaving, Dyeing, and Finishing, and has three affiliated courses in: Master Studies, Burling and Darning. Each department has its own curriculum and its own methods of study. The courses in spinning, weaving, and finishing can be completed in one half-year; while the course in dyeing occupies a full year. The instructional force consists of ten regular teachers and five masters. The theoretical instruction of the classroom is supplemented by thorough practical work in the large workshops or actual textile factories connected with the institution. A 100 horse-power engine supplies power for the operations of the factory, in which run all machines appropriate to the four branches of the textile industry taught in the school. Here students are at work passing the raw materials through the successive stages of manufacture. The products are placed upon the market. There are generally some 40 to 50 hands busy in the workshop. Local manufacturers, as a rule, contract for the output.

ENTRANCE REQUIREMENTS.

For entrance into any of the four departments of the school proof must be adduced of an education equivalent to that acquired in the common schools. In lack of such proof an examination is necessary in arithmetic and German. Foreigners must show sufficient familiarity with the German language to be able to follow the instruction with understanding. All students must have attained the age of sixteen years. Previous practical employment in a textile factory, which is quite a common requirement in textile schools, is not required for admission into the Aix-la-Chapelle school, though it is strongly recommended. Those who desire such practical experience prior to taking a course are privileged to enter the workshop associated with the institution.

CLASSES OF STUDENTS.

Three classes of students are distinguished: full scholars (Vollschueler), who participate in all lectures, and in all practical exercises of their respective courses; practicians (Praktikanten), who are engaged in practical employment in the workshop only; and "Hospitanten," or visitors, who attend lectures and other exercises by choice.

TIME OF INSTRUCTION.

The courses occupy six months, with the exception of the dyeing course, which, as has already been said, takes one year. The half-yearly courses begin the middle of March and the beginning of October. The yearly course begins in March.

Practicians may enter at any time. The curriculums cover twenty-one weeks of forty-four hours each in the half-yearly courses. Daily lectures come between 8 and 12, and 2 and 6 o'clock in the summer course; in the winter course the lecture hours are from 8 1/2 to 12 1/4, and from 2 to 6 o'clock. Saturday afternoons are free. There are Christmas, Spring and Fall vacations, of about two weeks each. Those who desire to take examinations on completing the course may do so, though this is not required, and are supplied with special diplomas showing their rank. Those who take no examinations are merely supplied with certificates of attendance at the school.

TUITION FEES.

The tuition fees are as follows: Full scholars (Vollscheuler), if Germans, pay 100 marks for every one half-year; foreigners pay 500 marks for the same period. Foreigners are not admitted to the course in designing, nor are they admitted as practicians; German practicians pay 50 marks per month as tuition fee. Visitors, or "Hospitanten," pay 15 marks for every hour per week for the half-year, if German; if foreign, they pay 50 marks instead of 15 marks. In addition to the above fees foreigners are required to pay 60 marks as admission fees. Tuition

fees must be paid at the beginning of a course. Needy students may be relieved in whole, or part, of the payment of tuition fees. Only one course may be attended and paid for at one and the same time.—The Textile Recorder.

MEASUREMENTS IN THE PHILIPPINES.

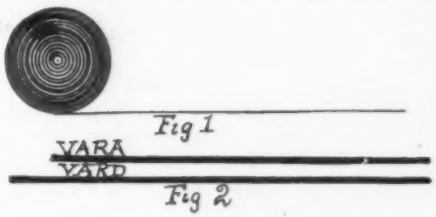
BY TRAVELER.

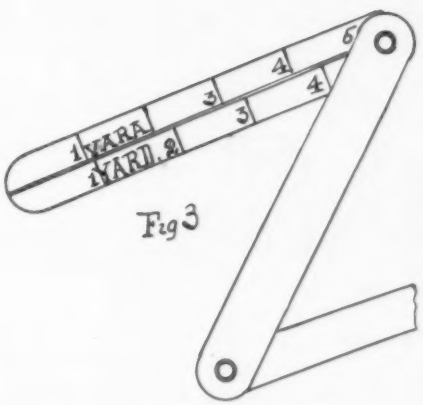
When one goes into a store in the Philippines and asks the price per yard of certain goods, a fair price is named, and then when the measurement is made, he finds that it is about four or five inches short on every yard. Then comes the explanation of the straight stick or tape line measurement. The dealer brings out a tape line like that in Fig. 1, on which inches are printed, but every inch is a little short, and every yard a few inches shorter than the American yard. This is the Spanish vara, but shopkeepers and others are in the habit of calling it a yard, using the term "yard" instead of "vara." Some of these tape lines are designated with proper lettering for indicating both yards and varas for convenience. Fig. 2 shows the comparative lengths of the straight vara and yard sticks. I noticed that some of the dealers had both these sticks hung up back of the counter, and would use either one as desired by the customer. These merchants of course have a different price for the two lengths, that for the longer American yard being a little higher than for the Spanish vara.

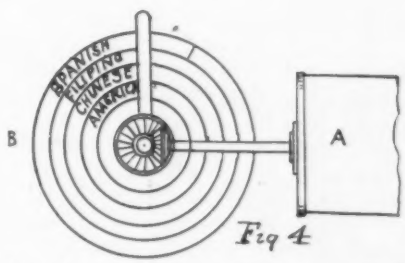
Lately the shopkeepers have introduced some handy sectional rules made of wood, with joints arranged as shown at Fig. 3. This is for pocket purposes as it can be folded to a length of six inches. On the face of the rule is a double system of letters and figures. The upper portion of the rule is marked off for varas and the lower portion for American yards. Thus the customer has the two kinds side by side and can take his choice. Almost invariably the American wants his own kind of yard and the Spanish his own vara.

I found some odd but handy disk measuring devices in some of the stores. Fig. 4 is a sketch of one of them in which four standards of measurement are used. There is a cylinder of wood, A, very like that used by the measurers and inspectors in American mills, and over which the cloth is drawn.

The cylinder is supported by bearings hung to the wall, and at either end is a metal disk, B, on which are figures which indicate the length of the cloth delivered by the cylinder, by the Spanish, Filipino, Chinese







and American systems. The gauge dial revolves with the cloth cylinder, with which it is connected by bevel gears as shown. It is an ingenious device and in use in the larger stores where long pieces of goods are measured.

The mixture of the Spanish vara used

here with the English, Filipino and other systems of measurement is quite bewildering. The meter of the metric system is also used with the local standards. There are many Chinese, Hindoo, and some German merchants, and they have introduced various systems of measures. The common people when left to themselves use the straight Spanish tables of measurement, as the Spanish have published these for them.

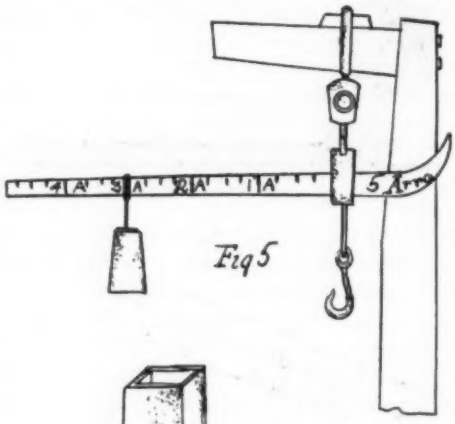


Fig 5

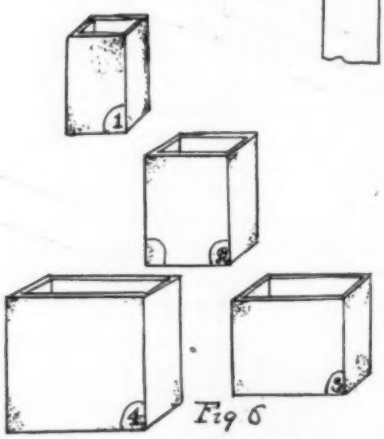


Fig 6

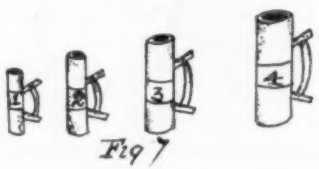


Fig 7

The vara is understood by all. The metric system is used in the railway service, the custom house and other government offices. The railway, however, is controlled by Spaniards. The storekeepers, carpenters, masons, artisans, and others generally use the Spanish measurements. I have always heard the boss carpenters, masons and others in charge of work, give directions regarding dimensions to the workmen in Spanish terms and according to the Spanish tables. Occasionally a school-trained worker speaks of inches, feet, yards, etc., but not often. The same condition is found in land measurements by the farmers. A friend explains to me how many square yards he has purchased from a native land owner, and then in addressing the native uses the native terms entirely. Farm produce is measured out in square wood boxes, marked with Spanish measures.

Fig. 5 is a drawing of the usual form of scales one sees in service along the wharves, in industrial and commercial houses, markets, railway, freight, and custom houses, etc. These scales are made by the Chinese, several of whose shops I recently visited. The marks on one side of the bar indicate Spanish weights; the other side is marked to order for English, Filipino, Hindoo or whatever standard is wanted.

The Spanish and Filipino have queer methods for measuring material in bulk. The Chinese follow suit. Instead of metal quart utensils one sees square wooden boxes numbered as shown in Fig. 6. Letters or figures corresponding to the Spanish or Filipino standards are stamped or burned on them, to indicate how much rice, grain, flour, or other dry stuffs they hold. The boxes are often soiled and cracked, but all are tested as to the contents and passed by the inspector so that correct measurement is assured. Sometimes the entire outfit is made up of tubes of bamboo, all properly stamped in burned letters and certified to by the inspector of weights and measures of the archipelago. No undersized utensils are permitted. If any are found they are seized and the owners fined. Fig. 7 shows a number of these bamboo tubes for liquid measurement.

It is said that the birthplace of cotton manufacture was India and that it was born again in England.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Dye House for Skein Yarn.

Editor Textile World Record:

Please give me information regarding the equipment of a dye house for 5,000 pounds woolen and 3,000 pounds cotton skein yarn per week. The yarn is to be scoured before dyeing. We also want to bleach some yarn. How much help would be required? Skein (392).

An experienced dyer makes the following reply to the above question:

The cotton yarn can be dyed without scouring and only the very brightest colors will need bleaching. For wool a peroxide or sulphur bleach can be used.

For cotton dyeing one small boiling kier will suffice; one 6 feet by 6 feet will be large enough to boil 500 pounds per day. This kier should have a vomit pipe. For dyeing ordinary direct colors one tub will do, but it is better to have plenty of vats, say one for each shade, reds, blues and yellows, or four tubs. Standing tubs will be necessary in order to dye economically. One extractor and one 500 pound yarn dryer will be required.

Worsted yarn requires little scouring. Some dyers use a lukewarm bath with a little olive oil soap at 90 deg. F. Two machines will do more than is wanted, that is, 850 pounds of woolen or worsted yarn in 10 hours. At the same time it is better to have plenty of machines and keep each one on the same shade. Dark blues and blacks could be dyed in one machine, tans and browns in another, etc.

Scouring could be done in a machine or in a regular dye tub. This also applies to the dyeing, which could be carried on in an ordinary tub.

To sum up I would recommend:

For the woolen yarns: 4 yarn tubs 29 inches deep, 26 inches wide, 10 feet long; one 48-inch extractor; one dryer of 1,000 pounds daily capacity, and one small bleach house or a tub fitted for peroxide of sodium bleach. This last can be of wood or stone. Instead of yarn tubs, two or three small dyeing machines can be used, say of 200 pounds' capacity. Five men besides the dyer could handle the woolen yarn; four men on the tubs and one man to do the extracting and hang the yarn in the dryer.

For cotton yarn: 4 tubs similar to those used in woolen dyeing, or the same tubs can be used for both cotton and wool. The one 48-inch extractor should do for both the woolen and the cotton yarns, allowing that the cotton will have to be extracted twice; one dryer of 500 pounds' capacity and one boiling-out kier.

The salary for a man to run such a plant would vary from $25 to $40 per week. In some plants there are two men, one for the woolen and one for the cotton, but there are men who make a specialty of this line of work and can do both the woolen and the cotton.

If I were going to start such a plant as your correspondent wants I should first hire the very best man I could afford and let him lay out the dyehouse to suit the work that he will have to do. The cost of labor, including the pay of the dyer, will amount to about one cent per pound.

Mordant for Worsted Yarn.

Editor Textile World Record:

Is there any advantage in the use of Glaubersalt and vitriol over bisulphate of soda as a mordant for worsted yarn? Is there as much risk of weakening the yarn with bisulphate of soda as with the Glaubersalt and vitriol? What is their relative commercial value?

Gill-Box (382).

A practical dyer and chemist answers this question as follows:

Neither of the substances mentioned are "mordants" for wool, but are rather "assistants"—causing a breaking up of the dyestuff in the dye bath, and aiding the color base to go on fibres, while the residue remains in solution.

It has been claimed for the bisulphate of soda that it aids in the production of level shades, especially when used with dyes that have a very strong affinity for wool, but in order to ensure these level shades it is necessary to use a large quantity of the salt, while on the other hand, using Glaubersalt, which is nearly neutral, a larger quantity can be employed ensuring level results, while at the same time only sufficient oil of vitriol may be used to decompose the dye and without any fear of injuring the yarn, which is frequent when using bisulphate.

It would be difficult to calculate the efficiency of acid and Glaubersalt compared with bisulphate of soda for the reason that their action is very different on any one dyestuff.

As a rule, the general favorite with most wool dyers is Glaubersalt, adding such quantities of acid to it as may be necessary to spring the color, leaving the salt itself to regulate the evenness of the desired shade.

Cotton Spindles and Consumption of Cotton

Editor Textile World Record:

I would like to know the amount of cotton consumed in Northern and Southern mills for the past ten years, also the number of spindles in operation in each section for the same period.

Paramount (372).

The following table shows the spindles and bales of cotton consumed in Northern and Southern mills for the eleven years ending with 1902, the figures being taken from "Cotton Facts." It also gives the average consumption of cotton per spindle for each year:

	North			South		
	Spindles	Bales	Lbs. per Spindle	Spindles	Bales	Lbs. per Spindle
1892	13,250,000	1,815,000	68.4	1,950,000	616,000	157.9
1893	13,450,000	1,762,000	65.4	2,100,000	660,000	157.1
1894	13,500,000	1,648,000	61.0	2,200,000	639,000	145.2
1895	13,700,000	1,813,000	66.1	2,400,000	806,000	167.9
1896	13,800,000	1,630,000	59.0	2,850,000	840,000	147.3
1897	13,900,000	1,771,000	63.7	3,250,000	946,000	145.5
1898	13,900,000	1,771,000	63.7	3,550,000	1,151,000	161.9
1899	14,150,000	2,218,000	78.4	3,950,000	1,364,000	172.6
1900	14,400,000	2,163,000	75.1	4,700,000	1,524,000	162.1
1901	14,700,000	1,909,000	64.9	5,500,000	1,526,000	138.7
1902	15,000,000	1,996,000	66.5	6,400,000	1,912,000	149.3

The greater consumption per spindle in the Southern states is owing to the coarser sizes spun in that section, and the increase in the aggregate number of spindles in the South is due to well known causes which have been frequently referred to in these columns and which now show signs of disappearing. It is not likely that the next ten years will witness a like disproportion in the increase in the two sections of the country.

Calculating the Width of Cloth in the Loom.

Editor Textile World Record:

I notice that the loom reed for cotton goods is often figured by subtracting 1 from the number of threads per inch finished, and dividing the remainder by the number of threads per dent. For example:

Find the reed for a 64 sley cotton cloth with 4 threads per dent.

$(64 - 1) \div 4 = 15\ 3/4$ reed.

Some calculators take 5 per cent. from this remainder:

$15\ 3/4 \times .95\ (100\% - 5\%) = 14.96$.

In this case they would use a 15 reed.

This practice is confined to the cotton industry. I wish you would explain why they deduct 1 from the number of threads per inch finished.

Ego (398)

The practice of calculating the reed referred to by Ego is purely arbitrary. Cotton goods are woven wider than the finished width in order to allow for contraction due to take-up after weaving, and the allowance of 1 thread per inch is made for this purpose. It does not answer for all cases because the take-up varies with the size of the yarn and the weave, as well as with the number of threads per inch, consequently the difference of 1 between the finished and loom set of cotton fabrics may be right for one weave or size of yarn and wrong if the weave or size of the yarn is changed.

A better practice is employed in the woolen industry where the loom width is first determined by making what is considered the necessary allowance for take-up. The threads per inch in the loom are then calculated from the total number of ends and the required width.

Ex. A cloth to be finished 55 inches wide is to be laid 75 inches wide in the loom with 4 threads per dent. There are 3,000 ends in the warp. Find the reed required.

$3000 \div 75 = 40$, threads per inch in the loom.
$40 \div 4 = 10$, reed.

This is the best practice for calculating the reed for cotton as well as woolen goods, as it is based on a preliminary estimate of the proper allowance to be made for take-up.

The wide variation in the loom width of woolens and worsteds on account of the shrinkage due to fulling explains why the arbitrary method mentioned by Ego is not used for these goods.

We referred Ego's question to a practical cotton goods manufacturer who makes the following reply:

"While many men in the cotton industry make a practice of deducting 1, yet it is not the only rule used, and in fact is not nearly as good as it is claimed to be. Personally I prefer a method similar to that used for worsteds. Where the reasons for deducting 1 from the sley comes in I do not

know, as it is manifestly impossible for one to get good results thereby. It stands to reason that the higher the count, the more the shrinkage, and yet by deducting 1 from 100 you get 1 per cent., while 1 from 50 means 2 per cent. The second calculation is nearer the mark. I object to the 1 at the start, but uphold the 95 per cent. idea. This is the rule that is in general use, but it is not a good rule nevertheless.

"My rule is to find the number of ends to be used. For instance on a 100 × 100, 40 inch goods, it would take 4,000 ends to give the required cloth. From 24 to 36 ends are used as doubles for the selvage, and thus 3,976 ends are available for use in finding the reed. The next thing is to determine the shrinkage of the cloth, and to do this we must know the counts, weight, filling and kind of weave, as all these have an effect on the shrinkage. Then again with stop-motions a little more width must be allowed, so that on a 100 × 100 7 yards, 40 inch goods, we should need about 43 1/4 inches in the reed.

3,976 ÷ 43.25 = 91.93, threads per inch.
91.93 ÷ 2 = 45.96, reed or 46 dents per inch, or:
4,000 — 24 = 3,976.
3,976 ÷ 2 = 1,988, dents required.
1,988 ÷ 43.25 (width required = 45.97 reed or 46.

This rule is similar to that for worsted and woolen goods and the only one worth considering when correct results are wanted, but in many mills they use the other for the sake of uniformity and allow extra ends where the shrinkage is greater, thus giving more than the required sley; when the shrinkage is less they take out some ends, and in the end come out about even.

Arthur Dyson.

Bleaching Raw Cotton.

Editor Textile World Record:

Is it practicable to bleach raw cotton in the regular raw stock dyeing machine? Please describe the operation of bleaching in the raw stock.

Lenox (394).

Roger Williams answers the above question as follows:

In regard to your inquiry concerning bleaching in a raw stock dyeing machine I will say that it can be done, but the dyeing machine will not have a very long life. I know of one man who tried bleaching in ordinary machines and they wore out in nine months. This was when the machines were built of wood. Now these machines are built with an iron frame and made stronger, but unless specially built for it, they are hardly fitted for bleaching because the action of the chlorine and the sulphuric acid is destructive to the metals used in the construction of the machine.

I understand that one large American mill is using a modification of the Obermaier dyeing machine for bleaching. The stock is not moved through the bleaching liquor, but the liquor is circulated through the stock by means of rotary pumps. With the aid of storage tanks the bleaching can be done with one machine. With a number of the machines and an overhead track the stock can be hoisted out of the different liquors, and the work of bleaching carried on continuously at a low labor cost.

The machine should be constructed so as to resist the action of chlorine and acid. A simple form of this machine can be made of wood with storage tanks for chlorine and acid. This can be arranged so that lots of 1,000 lbs. can be handled in one operation. That is to say, the raw stock can be put into the machine and no more labor will be needed until the bleaching is complete and the stock ready to be removed.

The stock is first boiled in the usual manner and washed with cold water, then bleached for one hour with chloride of lime solution at 1 deg. Tw. and well washed. It is then neutralized with sulphuric acid solution from 1/2 to 1 deg. Tw. and then well washed. Instead of sulphuric acid, bisulphite of soda, anti chlorine or even normal sulphate of soda (Glaubersalt) can be used for neutralizing. Some bleachers do not sour or neutralize after the chlorine, but simply wash well, and they get very good results.

When the bleached stock is to be spun into yarn I do not believe there is any gain by bleaching in the stock. The extra cost of carding, the amount of waste in picking and the generally inferior results obtained where the bleaching is done in the raw stock will fully counterbalance any extra cost for reeling, etc., or where the filling is bleached on chains and quilled on a chain quiller.

As for warp there is no gain, but a loss. The bleaching of stock can be done no cheaper for either labor or drugs and there is the extra cost of bleaching of the short stock, seeds and waste taken out in carding, besides the extra cost of carding, as colored or bleached cotton does not card as well as grey stock. Again there is much trouble to keep the bleached stock clean during the carding process, especially where colored cottons are run in the same room.

*South Carolina, Blacksburg. J. W. Ryan, A. H. Pollock and J. F. Whisonant, who recently purchased the Blacksburg Spinning and Knitting Mill, have incorporated as the Buffalo Mills, with capital stock of $20,000 (privilege of increasing to $100,000). They propose remodeling the mill and manufacturing yarns exclusively. J. R. Killian of the Olympia Mills, Columbia, S. C., is also interested.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

The recent slump in the price of cotton has had a bad effect in that it has caused many of the retailers to cease placing fall orders to a certain extent. Beginning January 1st the jobbers throughout the country started their travelers to take fall business, and retailers were apparently willing to place orders at the advanced prices asked. Now that cotton has declined, they are looking for a reduction in manufactured goods and holding back orders in consequence. The prospect of their being able to get any lower prices is exceedingly slim, as present prices are on a basis of 10 to 10 1/2 cents for cotton.

It is noticed that the drop in cotton has not had the effect of carrying with it a comparative drop in price of yarns, probably due to the fact that spinners have been well employed, have no stocks on hand and very little cotton. This is an instance where those manufacturers who operate a spinning plant in connection with a knitting mill are in an advantageous position.

A number of mills are practically out of the market, having sold all the goods they can make from their stocks of yarns purchased, and it is intimated that they will shut down when their contracts are filled, unless there is some reduction in price of yarns.

There is a considerable difference of opinion as to how far buyers have covered their needs for the year. Some contend that not more than 50 per cent. of the season's business has been placed, while others say that certain buyers have bought with considerable freedom and will not need to add much to their purchases for the entire season. No doubt a number had foresight enough to load up well with ladies' six pound ribbed goods at $1.90, 12 pound fleeces at $3.50 and 11 1/2 pound ribbed goods for men at $3.62 1/2, although we are informed that some of the largest operators in the country were in the market when $2.20, $3.75 and $3.87 1/2 were the prices for the three lines mentioned.

Jobbers inform us that the retail trade in general are not taking the wool fleeced shirts and drawers as freely as in former seasons, and as a consequence some stock lots have accumulated which were sold to the jobbers at slight advance over last season's price.

Buyers are taking well the men's merino mixed and worsted plaited ribbed goods to sell at $1.00, and some very sightly goods are being offered at this price. One line in particular being made with a silk tipped collarette neck on the shirts with an outside band and strap back drawers and look much like the $1.50 and $2.00 grades of former seasons.

Considerable business has been placed on men's 11 1/2 pound cotton ribbed goods to retail at 50 cents and it is a noticeable fact that buyers are not calling so much for double seated drawers as heretofore. Manufacturers of this class of goods would do well to see that they have a proper elasticity, as there has been considerable complaint heretofore on this account. The sale of men's combination suits is increasing daily, and it is evident that manufacturers are paying more attention to fit and detail as retailers report less trouble in satisfying customers than in former seasons.

Buyers throughout the country are placing orders largely on ladies' six pound ribbed goods to retail at 25 cents and from the best information we can procure very few retailers are buying the goods offered at the price which permits them being sold at 29 to 33 cents. Many complaints are being registered against manufacturers of summer goods on account of the slow delivery of low priced ribbed vests and men's balbriggans. Some buyers even go so far as to intimate that manufacturers are holding back in hopes of getting cancellations and re-selling their goods at present prices. If this is true, how much more so will a complaint be in order on fall

goods where sales have been made on the same garment at $1.90, $2.00, $2.12 1/2 and $2.20.

HOSIERY.

A number of hosiery buyers are now in the market and a fair amount of spring goods is being sold and some inquiry made for fall lines by retail buyers. The few manufacturers who are making ladies' wool hosiery report a fairly satisfactory business at practically last season's prices, although some slight advances have been obtained on the low end. The worsted yarn market is in a firm condition and as a consequence prices of worsted goods are firmly held and advances are imminent.

FANCY KNIT GOODS.

The fancy knit goods business is in a good condition and the sales of ladies' and men's sweaters are increasing. Some attractive novelties are being shown in vertical striped blouses for ladies, also in military sweaters for juveniles. These are made to open down the front in coat form and are ornamented with brass buttons, collar ornaments and may be had to retail at $1.00.

We notice that retailers are giving this end of the business more attention than heretofore on account of their being able to do a trade during the summer as well as during the winter months. The demand during the summer being from summer resorts principally.

"Sheep have golden feet, and wherever the print of their footstep is seen the land is turned to gold."—Spanish proverb.

It is not known just when the manufacture of cotton was begun in England, but it was probably towards the close of the sixteenth century by the Flemish emigrants.

Coxe, the first proprietor of South Carolina, wrote of that state in 1698: "Hemp and flax are very common in this country, sufficient to supply the British market. Besides we have a silk grass which makes very pretty stuffs whereof a garment was made for Queen Elizabeth which she was pleased to wear for divers weeks."

A NORTHERN SUPERINTENDENT IN SOUTHERN KNITTING MILLS.

BY NANTUCKET.

The story of my experiences in southern mills may not reflect credit upon the manufacturing corporations referred to, the principal reason being lack of practical experience on the part of the mill owners. They did not know how to meet the problems constantly arising in this comparatively new field of textile industry which is developing so rapidly throughout the southern states. An account of my experiences there, however, may help those now connected with the knitting business and guard them against some of the many pitfalls open to the inexperienced.

Before going to the South I had had fifteen years' practical experience in the manufacture of underwear in well equipped northern mills. In one of them I served a three years' apprenticeship in all departments, preparatory to fitting myself for a superintendent's position, which I afterward reached, as well as that of agent.

We (my wife and I) left New York bound for the sunny South in the spring of 1901, taking passage on one of the fine steamers of the Ocean Steamship Co. for Savannah, Ga., where we arrived after a delightful trip of three days down the coast. At Savannah we took a train for an interior city. On reaching our destination we were met by the officers of the mill and I was conducted out of the city about two miles to the building in which were located the knitting and auxiliary machines.

The exterior of the building gave me the horrors. It had no resemblance whatever to the knitting mill buildings one sees in the towns and cities of the North. Turning to the officer of the company, I asked:

"Is this your knitting mill?"

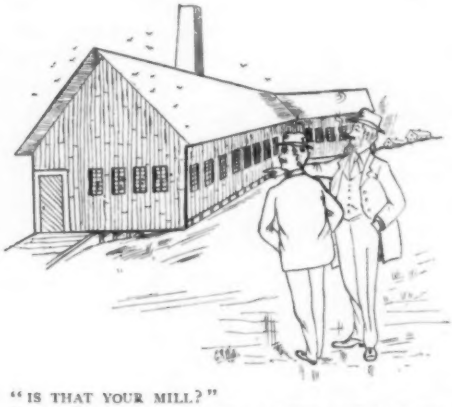
"It is," he replied, with evident satisfaction.

"Well," I said, "it looks for all the world like a car shed."

Afterward I was in Atlanta, Ga., and when I saw the antiquated passenger depot

there, I was surprised to see how closely the knitting mill and depot resembled each other. The old car shed knitting mill has now passed into oblivion, being replaced by a new modern building suitable for the knitting business, and Atlanta is to be improved by a commodious and handsome depot in the near future.

Going into the mill I was dumfounded for a few minutes. Lying all about the workrooms were goods in every process of manufacture, left as one would expect when shutting the mill from Saturday night to



"IS THAT YOUR MILL?"
"IT IS," HE REPLIED WITH EVIDENT SATISFACTION.

Monday morning. I asked the company's official if this was the case and received the reply that the mill had been shut down three weeks awaiting the arrival of the new superintendent. I realized at once that I was face to face with a condition in which system, detail and proper care of merchandise had received but little attention.

My first impulse was to throw up the sponge, but on second though this seemed to be cowardly as I had made a contract as superintendent of the mill for a year. The mill was shut down, the help scattered, the goods in process of manufacture in a helter-skelter mess, the officers of the company without practical knowledge or experience, unable to suggest a starting point in order to straighten matters out and practically as much in the dark as to the existing conditions of the business as I was.

After considering all sides of the question, pro and con, and thoroughly realizing that I was up against it, I suggested to the official that we return to town that I might consult with my wife, who was to take charge of a department in the mill, and discover if possible where a beginning could be made to straighten out the work in process of manufacture and get the mill started up. The next morning before sunrise I started for the mill, my mind perfectly clear as to a starting point. It was to tackle the goods already manufactured, boxed, and ready for market. These goods were scattered from one end of the storeroom to the other, and the room was divided from the manufacturing departments by a wooden partition.

No care had been taken to place boxed goods in separate lots according to style numbers, and no attention whatever had been paid to sizes in piling up lots. They were simply scattered all over the floor, a space of 175 by 50 feet, in indescribable confusion. Before giving my plan for arranging these goods, some three thousand dozen, let me describe the appearance of the storeroom. The building before being utilized as a knitting mill, had been a guano factory, and while the building had been thoroughly cleaned before the machinery had been installed, yet guano dust was everywhere noticeable. Boxes containing manufactured goods were so covered with dust that the whole alphabet could have been written on the cover of each box with the letters clear and distinct. This, however, was not the worst feature of the room.

The building was poorly constructed, the side walls being made of upright boards from four to six inches wide and about one-half inch thick, with no sheathing inside. Cracks were noticeable all over the building and in winter the storeroom would have served well for cold storage purposes. These cracks were large enough to admit English sparrows, which had made their nests on the rafters and uprights of the roof. Hundreds of these nests were in sight and no protection had been provided to keep the bird droppings from the merchandise. The reader may be able to imagine the condition of the boxes containing the goods. It is impossible to describe it. I was not surprised to learn that the building had formerly been a

guano factory. Aside from the evidences of guano dust, real live producers of raw material of guano were apparent on all sides, as thousands of these sparrows made this storeroom their abiding place winter and summer.

My first step toward remedying these conditions was to get the consent of the company to build a temporary ceiling over a portion of the storeroom, a space 125 by 25 feet, dropping it about ten feet below the rafters where the birds' nests were. This did not interfere with the birds in any way. To drive them out entirely would have necessitated rebuilding the walls of the mill, and my ceiling afforded ample protection.

After the ceiling had been built, I began sorting out the various lots of manufactured goods, building platforms about two inches from the floor for them, and arranging lots according to style numbers and sizes. This occupied one entire week, as many of the boxes needed new covers to make them merchantable and remove evidences of the guano.

Having completed this task and neatly and systematically arranged the finished product in the storeroom, my next step was to tackle the goods in the various processes of manufacture. I began with the goods that were ready to be placed in boxes and worked backward to the knitted cloth, arranging each lot for the process following that already completed. This occupied another entire week, as there were some two thousand dozen of goods in this department in all stages of manufacture, and so completely mixed up in regard to quality and size that it was no easy matter to rearrange them. Different sized yarns had been used, varying one or two numbers, and every dozen had to be weighed in order to decide the size of yarn used, there being no size numbers or process tickets attached to the goods.

Having completed this task I was ready to start up the mill, but learned that the company had not secured a competent knitter or sewing machine fixer, though I had told them that men for these positions were absolutely necessary. Being a total stranger in the South I knew no one competent to fill these positions. I asked permission to secure a northern man for these places and through the Textile World was placed in communication with one then employed in a Massachusetts mill. After exchanging several letters he accepted the position of knitter and sewing machine fixer. I shall never forget the expression on the face of that young man from Massachusetts when I took him into the knitting mill. He never expressed his opinion of the situation. He was made of the right stuff and was not easily discouraged. We two Yankees simply shook hands, put our shoulders

WE TWO YANKEES SIMPLY SHOOK HANDS.

together, and with the assistance of my wife tackled the proposition before us.

I invited the young man to survey the storeroom as it had been newly arranged, showed him the arrangement for handling the goods in process, and introduced him to the sewing machines, which my wife had thoroughly and carefully cleaned with gallons of kerosene oil. They were, therefore, in very good condition, but had been a sight previous to her work on them. Last but not least, I introduced him to the knitting machines. For a time he was dumb. These machines, or rather their condition, could not have been duplicated anywhere on earth.

Rust everywhere, needles, cams, dials, cylinders and even take-up rolls where they did not come in contact with the cloth, all

covered with one bed of rust. At first we could not account for this condition as the mill had been closed three weeks, but afterward found it to be due entirely to the guano dust so noticeable throughout the building. The acids in this dust caused rust on the machines during the shut down over Sunday. To put the knitting machines in working order required gallons and gallons of kerosene oil and sheet after sheet of emery paper, while nearly all the needles had to be replaced with new ones. It took another week to put the knitting machines in order to turn out satisfactory cloth.

The machinery now being in condition to operate and the help engaged, one bright Monday morning, a month after reaching the mill, the whistle blew, the engine started and gradually all the machinery got into operation.

The young man from Massachusetts soon demonstrated his ability to take charge of the knitting department, so my mind was at rest in regard to the results from this part of the mill. In the finishing department I had the able assistance of my wife. She was thoroughly familiar with every process and able to operate all the sewing machines under her charge. I had no anxiety regarding the work in that important department.

For the first month after starting up the mill our efforts were devoted to finishing the goods already started and in lining up sizes to place the goods in a salable condition. During this month no changes in methods of working as taught to the operatives by my predecessor were undertaken. I merely watched them at work, getting pointers as to their ability and characteristics for future consideration.

I was very agreeably surprised by the apparent interest shown by the operatives in their work, and while the individual output did not reach within 25 per cent. of what northern operators would have produced, the difference was overcome by the difference in the cost of labor and working time, the laws of Georgia permitting factories to run seventy-two hours per week.

When the unfinished work in the mill was done I started the plant upon an entirely new line, similar to the goods produced in Cohoes, Amsterdam, Utica and Little Falls, New York. In taking up this line of work my wife began a thorough course of training with the operatives in every process and we were much pleased with the results obtained. Our operatives caught on quickly to the northern system of working and production advanced so rapidly that after three months with them our production was within 10 per cent. of that of northern operators, and before the first year had passed we were holding our own with the expert workers of the

UPON MY WIFE DEVOLVED THE ARDUOUS DUTY OF INSTRUCTING THE OPERATIVES.

North. But one unpleasant feature was noticeable among these southern workers and that was the snuff habit. Through my wife's efforts this gradually decreased until it ceased entirely during working hours.

Now that the operatives were thoroughly instructed in northern methods of working I began getting up my first lines of samples for the market, having previously selected agents to sell the goods, and producing lines identical with those I had already made in the North. When the sample lines were complete I submitted them to the company and to the help, and all seemed pleased with their appearance, workmanship and finish. The samples were forwarded to New York, and for several days we anxiously awaited

the reports as to how the line had struck our selling agents. Finally to our entire chagrin and disappointment we learned that not one good feature had been found in our entire line of samples. Fault was found here, there and everywhere, and suggestions made for corrections. I was crestfallen, for I felt certain the samples were worthy of commendation, and so did the company. I was satisfied in my own mind that the samples were salable, and after carefully studying the suggestions and improvements offered by our agents, and realizing that to prepare another line would make their arrival in the market too late to do any business that season, I obtained the consent of the company to submit a duplicate line of samples to a Chicago house catering to the retail trade. Having had no experience with the retail trade I felt somewhat uneasy as to results, especially with the product of a southern mill, but I saw no alternative if I wanted to run the mill that season. The samples were sent and in a week we received orders for twenty-five cases, sold from identically the same line of samples that had been sent to the New York agents and at prices 10 to 15 per cent. higher than those at which the goods had been offered in New York. The Chicago house was then duly appointed agent and through them additional agents selling to the retail trade were appointed until we had a line from Maine to the Pacific, and before three months had passed we had sold the entire product for the season and the samples were withdrawn.

Realizing that in catering to the retail trade I was dealing with keen, sharp, conservative business men, quick to discover imperfections and quick to reject imperfect work, I had some misgivings at being able to duplicate my samples, yet I started out, exercising the utmost watchfulness in every process, and secured competent inspectors to detect imperfect work. At the end of the year we had only three complaints covering five single garments which were returned.

This clearly demonstrates that high grade underwear can be produced here in the South and I firmly believe that just as good work can be done as in the North, providing the operatives are properly instructed and care, watchfulness and good judgment are exercised in the details that go to make up the perfect garment; providing likewise that proper consideration is shown to the help in the mill.

One of the faults most common among the northern superintendents and overseers who come to the South, and which hinders their success, is a lack of consideration and attention for the help. In the North superintendents and department overseers may go from one year's end to another without coming in contact with an inexperienced operator; in the South they would not be likely to come in contact with an expert operator. This feature tries the patience and soul of a practical mill man. He is obliged to take grown help and instruct them in every stage of their work, and if he is without the services of an expert forewoman who can instruct the operatives and can herself sit down to any machine and give a practical illustration of every process, he has a serious problem to confront. If he is not of the right temperament, endowed with a reserve force of patience, he will find himself at a great disadvantage and had far better remain in the North. Upon my wife devolved the arduous duties of instructing the operatives employed in this Georgia mill and the success we attained is due as much to her efforts as to mine. Without her help much that was accomplished would still have been undone or else half done, as no superintendent or overseer can, as a rule, sit down to a sewing machine, take a dozen of goods and carry same through the various processes from start to finish; much less can he impart to inexperienced female help the instructions necessary to make them expert. Such instruction can be given only by one of their own sex whose interests lie in obtaining satisfactory results.

Another thing that northern superintendents and overseers must learn is that southern girls cannot be driven, but they can be led by kindness, courtesy, gentlemanly treatment and moral suasion. Satisfactory results can be obtained without losing con-

trol over them or placing them or himself upon familiar terms or interfering with the discipline of any department. Another thing he will learn is that the women of the South, no matter how lowly their station, receive marked consideration and courtesy from the men at all times. Unless similar treatment is accorded by a northern man in his dealings with female help in the South, he will find his path not a smooth one and eventually he will prove a failure. The days of rough, sharp overseers are gone even in the North, but in the South such treatment of the help has never been tolerated. It is too expensive for mill owners to put up with.

The North can learn at least one lesson from the foregoing paragraph. Gentlemanly conduct at all times, and courteous treatment toward the female sex, stand supreme in this section of the country, and it is certainly gratifying to see it portrayed on all sides where the sexes mingle.

At the beginning of the second year I changed the running time from seventy-two hours to sixty-six hours per week and found we lost nothing in production. Our operators were less fatigued when they reported for work each morning and took still greater interest in their work.

Here let me outline the character of the help found in this inland city of Georgia. Our mill had been in operation off and on for two years prior to my taking charge, and many of the old hands returned to their former positions when the mill was started up under my management, and had, therefore, some knowledge of the work. Still this does not account for all the improvements afterward developed. No children under fourteen years of age were employed in the mill during my superintendency, and to this I attribute much of our success. I have not found the labor of children from nine to fourteen years of age, so frequently employed in the cotton mills of the South, to be profitable or beneficial in manufacturing underwear. After the cloth is knit it requires more intelligence than is usually found in a child to put the garments together and perform the various operations. Children cannot be successfully employed on sewing machines, and besides the sewing machine work there are only two operations where young help can be used, namely, in turning garments after being seamed preparatory to overseaming and in "dotting" for button sewing. Even in these processes a girl of fourteen years of age is far more profitable for she can be taught the value of time, of which a child under that age has no knowledge. After a trial in the two processes I have mentioned I discontinued altogether the employment of children under fourteen years of age.

All our operatives came from the so-called middle class families, supporting themselves and assisting in supporting their homes by the fruits of their labors. They were intelligent, neat, of good morals, quick to learn and to appreciate all that was done to advance them in their work. They were seldom absent except for sickness or other unavoidable cause and in such instances they invariably notified the office why they were detained at home. I am satisfied that no mill, either North or South, had a better or more willing and attentive set of employees than those gathered in the old guano building in one of Georgia's enterprising and prosperous cities. During the two and a half years I had charge of this plant it was found necessary to discharge but one operative, and not one left during that period.

The company continued to dispose of the product of the mill to the retail trade direct through agents located in all the principal business centres of the country. During the second year of selling to this trade not a single complaint was received as to quality, workmanship or finish.

In closing this article I take the liberty of making a few practical suggestions to owners of underwear mills in the South and to those who contemplate entering this business, also to superintendents and overseers who may already be located here or who contemplate doing so.

To manufacturers and owners: If you are inexperienced and not practical in the business secure a competent, reliable, and concientious superintendent. Place him in

absolute control of the manufacturing departments of your mill. Instruct all the overseers that they and the work of their departments are subservient to his orders. Treat with your employees through your superintendent. Countermand no orders he has issued without first consulting him as to their practical usefulness, for in so doing you destroy the discipline he may be introducing. In dealing with your employees over the head of your superintendent you are guilty of lack of discipline, you place his authority at naught and sooner or later his usefulness is at an end. Hold him at all times responsible for the work of each department, providing he is given exclusive control, and bear in mind that if he is a conscientious man, his reputation and his desire to maintain it are his stock in trade, and he is not going to make mistakes knowingly or permit them to be made. Treat your help courteously at all times and remember that they are the backbone, ribs and vitals of the business and as essential to its success as the capital invested and the machinery installed. All this can be done without in any way losing control of the management of the business. Try it and watch the result.

To those contemplating entering the business: Form your company with sufficient capital to equip your plant thoroughly, leaving an ample sum for working capital. If green help is to be employed you must realize that it will take time and money to develop your operatives and you need not look for prosperous results the first year. If a new building is to be erected, engage your superintendent and utilize his services in the construction of the building and the equipment of the plant. He then starts out under extremely favorable circumstances. I would then suggest the same line of action as outlined for manufacturers or owners.

To superintendents and overseers in the South and to those who may contemplate entering that field: You are not only apt to come in contact with green operatives who have never seen a knitting or sewing machine, but you are also apt to find inexperienced and unpractical men at the head of the mill. Should this occur, explain clearly and practically every important step you are about to take and every change you would like to make. Then if possible give a practical illustration of what you contemplate doing. The result will clearly disclose your purpose to your employers, and in nine cases out of ten your suggestions will be adopted. Insist on being placed in exclusive charge of all departments, subservient only to your employers. Consult them freely and openly on all matters pertaining to your position and the general work of the mill. Don't leave them in the dark on any matter that concerns their interests or involves any expense. You will find most of the southern business men quick to grasp a situation and ready to act with you openly and readily if you are honest, reliable and have your heart in your work. Study carefully the characteristics of the operatives under your charge. Be gentlemanly, courteous, and kind in your treatment of them, but do not by any means allow this treatment to grow into familiarity, for then you will lose control of them. If you are not blessed with a wife thoroughly competent to operate every sewing machine, set needles, fix thread tensions, and who knows by looking at work coming from various processes whether the machine is performing its work properly, secure if possible some competent northern forewoman who has a wide experience. Utilize her services as instructor of the various finishing processes. By doing this you will gain at least six months time over any other mill not so favored. If you cannot secure the services of such a person, then select from those applying for work some neat, bright, intelligent middle age woman, if possible a stranger to the rest of the help. Before starting up the room instruct her in every detail of each machine and the work to be done on it. When you are ready to start the finishing room place your already instructed operator in charge of each new employee and have her teach them exactly as you want the work done. If the mill is already running without such a forewoman, secure one who is experienced. Do not attempt to instruct a green hand for

this work in the presence of the other operators, as they are quick to notice an inexperienced overseer and are loath to take orders from one not familiar with the work. If you do you will find yourself in hot water two-thirds of the time.

If these suggestions are followed I am certain the underwear business here in the South will grow with rapid strides, and before another decade passes I see no reason why the South should not develop the manufacturing of underwear upon as large a scale as it has the manufacture of cotton piece goods, and produce goods that in quality, workmanship and finish will enable the southern mills to take a position in the front rank among the mills of the country, instead of playing second fiddle to the North as at present. Who knows but what in ten years' time the South will not be leading the North in manufacturing cotton knit underwear as she is now fast doing in cotton piece goods? I am very sanguine that this will be the case.

SETTING UP AND CARE OF SPRING NEEDLE CIRCULAR MACHINES.

BY F. W. HERINGTON.

(Continued from January.)

Fig. 64 is a top view of the needle cylinder, G, Figs. 60 and 62, with the inside circle, S, which is fastened to the stud, Y, by means of the screw, T. The stud, Y, is the stud which is fastened to the table of the machine, and on which the needle cylinder revolves. R is the grippe attached to the inside circle, S, to which is attached the arm and stud, W, on which the landing burr, D, revolves.

Fig. 65 is a side view of the inside circle, S, with its screw, T, to which is attached the grippe, R, with its adjusting screws, U and V, the stud and arm, W, being attached to the lower part of grippe, R. The landing burr, D, revolves on the stud, W.

Fig. 65 also shows a side view of the needle presser stand, A, fastened to the slotted link, B, by the screw bolt, X; the tube, C, with its rod, K, adjusting screws, L; needle presser stud, Z, to which is attached the stationary needle presser, P.

The landing burr, D, is made adjustable either up or down by means of screw, U, which is a part of the grippe, R, and is made adjustable as to its angle and also in or out, by means of screw, V, which fastens the arm and stud, W, on which landing burr, D, revolves, to the grippe R. It is made adjustable sideways by loosening nut on back part of grippe, R, Fig. 64, and sliding it in either direction on the inside circle, S.

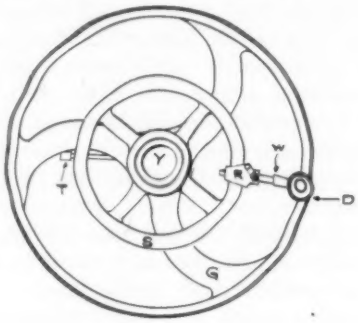


FIG. 64

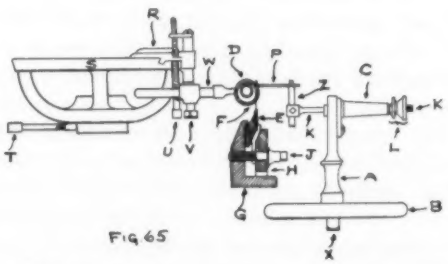


FIG. 65

The landing burr is so called because it "lands" or carries up, the previously formed loops, or stitches, to the point of the beards of the needles, while at the same time, the needle presser, P, Fig. 65, closes the beards of the needles, which permits of the landing burr, not only carrying the loops up to, but also over and above the points of the beards of the needles.

The landing burr is set, therefore, to accomplish this result, and is set first so that the wheel itself comes up to, about a quarter of an inch from the revolving cloth wheel, D, Fig. 60. For very light or thin cloth, it may be set even closer to the revolving cloth wheel, D, than 1/4 of an inch from it. All that is required, is that there shall be suffi-

cient room for the knit cloth to pass freely between them. Fig. 68 shows the position of the landing burr and revolving cloth wheel. Secondly, it is set as to height so that the blades will clear the top part of the lead of the needles, as at Fig. 65, F, and also so that the wheel will carry up the previously formed loops to a point just over and above the points of the beards of the needles. Thirdly, it is set as to angle, the same as the sinker burr, so that the blade or wing of the burr in entering the needles, will be parallel with them,—and as to depth, so that about four

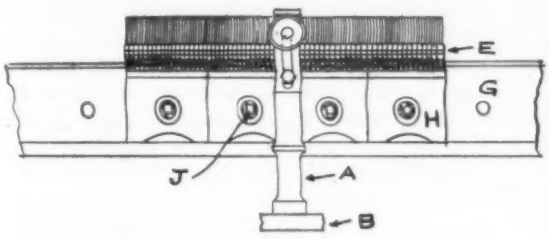


FIG. 66

of the blades of the burr will project through to the outside of the needles.

When using very tender or soft yarn, the landing burr will be set so that even less than 4 blades project, and also as to height, so that it "lands" the stitches just over the points of the beards of the needles.

The stationary needle presser, P, Fig. 65, is set directly over the wings of the landing burr, that project through the needles, and to the left of the wheel, so that the landing burr will clear the right hand side of the needle presser, P.

Its purpose is to close the beards of the needles, as the landing burr raises the stitches up to and over them.

It is made adjustable up or down by means of stud, Z, which is fastened to rod, K.

The pressure on the beards of the needles is adjusted by means of the screws, L, which control the rod, K.

It is made adjustable sideways by means of the slotted link, B, which can be placed in either direction on the slotted circle, 7, Fig. 68.

Fig. 66 is a front view to show the outside cast off stand, A, the other parts being same as shown in Figs. 60 and 62.

Fig. 67 is a side view of the outside cast off stand, and the outside cast off burr—showing also the same cross section as shown in Figs. 61, 63 and 65. A is the stand; B, the slotted link, to which the stand is fastened; C, the tube which holds the spring controlling the rod, K; M, is the outside cast off burr; R, the arm and stud on which the cast off burr revolves; S, the set screw, which fastens the arm and stud, R, to the rod, K.

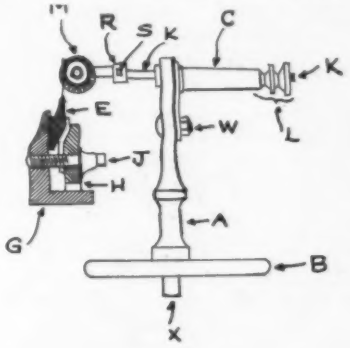


FIG. 67

The cast off burr is set as to angle, the same as the sinker and landing burr.

Its purpose is to "cast off" the stitches up and over and above the tops of the needles, after the landing burr has left them over the points of the beards of the needles.

The casting off of these previously formed loops or stitches, while the yarn is in and at the tops of the needles, placed there by the sinker burr, forms new loops or stitches, and they then become the previously formed stitches for the next preceding set of wheels and burrs which constitute another "feed."

In order therefore to cast off these loops, the cast off burr must be set high enough, to cast them up and over and above the tops of the needles, and to form the new loops according to the length of the stitches. It should project through the needles about half of its depth between the outside point of its wings or blades, and the inside hub, to which the wings are securely fastened.

If it is set up too high, the point of the blade in entering the needles will be liable to catch the point of the beards of the needles,

and break them off, and also, there would be too much strain on the yarn forming the new loops, which would cut the yarn, and result in holes in the cloth. If it is set so that the wings project through the needles too far, the result would be too much strain on the yarn, the same as if set too high, with the same result, holes in the cloth.

As to its position, it is set about 1/2 inch to the right of the landing burr.

There is also an inside cast off burr, which is a similar burr, except that it works from

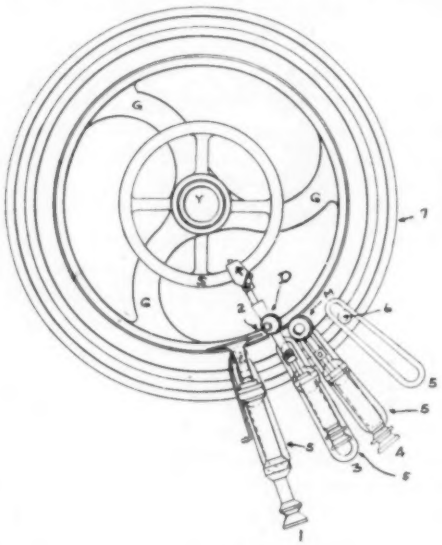


FIG. 68

the inside of the cylinder the same as the landing burr, its angle is cut in the opposite direction from the outside cast off burr.

When an inside cast off burr is used, a grippe on the inside circle is used the same as for the landing burr.

It is set the same as the outside cast off burr, except that it cannot be set as close to the landing burr as the outside one can, because the arm, W, Fig. 64, of the landing burr, comes in contact with the lower part of the inside cast off burr, and with the outside cast off burr. This arm, W, does not come in contact with the burr at all. The outside cast off burr is made adjustable up and down, by having the stand, A, slotted below and above the bolt and nut, W, Fig. 67, so that by loosening this bolt and nut, the tube, C, together with all the parts connected to it, can be raised or lowered.

It is made adjustable as to the angle by means of the stud and arm, R, which is fastened to the rod K by the set screw, S, Fig. 67.

It is made adjustable as to the depth into the needles, by means of the screws, L, which control the rod, K. Turning these screws to the left, causes the rod, K, to go towards the needles, and thus set the burr deeper into them. Turning them to the right draws the cast off burr away from and out of the needles.

It is made adjustable sideways in either direction in the same manner as already described for the other stands.

Fig. 68 is a top view of a complete single feed for the plain stitch as set up. G is the cylinder arms; S, the inside circle; R, the landing burr grippe; Y, the stationary stud on which cylinder, G, revolves.

1 is the sinker burr stand, with the revolving cloth wheel attached, and also with the sinker burr and yarn guide.

D is the landing burr, attached to grippe, R, which is fastened to inside circle, S.

3 is the needle presser stand, with its stationary needle presser, set over and above the landing burr.

4 is the outside cast off burr stand, with its outside cast off burr, M.

5 indicates the slotted links to which all the stands are fastened; 6, the bolt and nut which fasten the slotted links to the outside circle, 7.

7 is the slotted outside circle which permits the adjustment of slotted links in any manner or direction desired.

All the stands and parts thereof are therefore stationary, except the burrs, which revolve on their studs, by means of their contact with the needles, and the revolving of the cylinder.

Fig. 68 shows only one complete single feed for the plain stitch as set up, but it will readily be seen, that as many feeds as the circumference of the cylinder will permit, can be put on around the cylinder, it being necessary only to allow about 2 inches of length on the needles, between the cast off burr of one feed and the revolving cloth wheel of another, and

also a small space in the front of the machine for the placing of the stop motion and also for putting on the cloth on the needles, when from various causes it comes off.

From 4 to 14 feeds can be put on one cylinder, according to its circumference, the larger the diameter of the cylinder, the more room around the circle for the stands for the "feeds."

It will also be understood, that if there is only one feed on a cylinder, that the cylinder must make one complete revolution, in order to make on course of loops, but if there are 4 feeds, on a machine, one revolution of the cylinder will make 4 courses of loops, or will knit cloth 4 times as fast as one feed, and so on according to the number of feeds.

After having set up all the feeds on a cylinder, it is then ready for the cloth.

(To be continued.)

The Temperature of the Knitting Room.

Editor Textile World Record:

Will you kindly give us your opinion regarding the temperature at which a knitting factory running various styles of knitting machines should be kept during the winter months, and state whether the temperature should be kept nearly the same during the twenty-four hours of the day, or whether lowering the temperature at night would be apt to affect the running of the machines in the morning of the next day. Hot Air (400).

The temperature at which a knitting factory is kept has a very important effect on the running of the work. The temperature of a knitting room should not be allowed to go down at night. It ought to be kept up to 70 degrees all through the night to insure good results. If the iron and steel of the machines get cold and chilled, it means bad work, as the yarn sticks to the needles and causes trouble. With some types of machines, particularly full fashioned machines, if allowed to get cold, it materially affects the adjustment, made to run properly when the room is warm, and this cooling off is a very frequent cause of holes. The more even the temperature can be kept, the better the results.

We shall have more to say on this subject in an early issue.

James Taylor, of 835 Arch St., Philadelphia, Pa., the well-known dealer in machinery for knitting underwear and hosiery, has recently been in New England picking up several plants in various lines, which he is offering at attractive prices. His monthly list of bargains in his advertisement, on another page, is, of course, only a very small portion of his stock on hand, which covers practically everything in the way of knitting and auxiliary machinery, including dyeing and washing machinery. By change of product, and displacement of old machinery to make room for new, manufacturers are constantly in touch with Mr. Taylor who is always in the market to buy, sell or exchange.

Duplicate Orders.

The Knoxville Knitting Mills Co. of Knoxville, Tenn., has placed another large order for the Invincible automatic knitting machines. This is the third order this company has placed with the E. Jenckes Manufacturing Co. for Invincible machines, after having tested other makes of machines. The Climax Hosiery Co. of Athens, Ga., is also adding more Invincible machines.

The paper box department of the Bibb Mfg. Co. of Macon, Ga., has been enlarged at various times since being installed by the Chas. Beck Paper Co. of Philadelphia, and we understand is a great money saver, paying for itself within a comparatively short time. The newest addition to the plant is the installation of machines, which they have largely developed themselves, for making cop tubes, both straight and tapering, and the work produced is of a surprisingly good quality.

Hosiery Band Stock.

The Charles Beck Paper Co. of Philadelphia is having a big trade on white and black band stock for hosiery, underwear, silk, cloth bands, etc. Interested parties may obtain samples already printed and embossed in either white or black, which will show in an attractive manner the working qualities of this special stock. Every manufacturer knows how important is the attractive appearance of goods when shown to a buyer, and a handsome band and label goes a long way towards setting off a line.

Can See Dresdener Machines in Operation.

Parties who have been interested in reading of the new Dresdener knitting machines can now have the opportunity of seeing them at work in this country under mill conditions at the factory of Walter Schoebel, 101 Ralph St., Brooklyn, N. Y., where 25 machines of the latest type are in operation. These are adapted for the production of novelties in fancy patterns for sweaters and waists. Mr. Schoebel is the agent of these machines, and would be pleased to show them to interested parties.

Recent Knitting Patents.

KNITTED FABRIC. 752,862. Andrew W. Redin, Kenosha, Wis.

KNITTING MACHINE. 751,213. Bernard T. Steber, Utica, N. Y.

KNITTING MACHINE BUR WHEEL SUPport. 752,666. Robert W. Gormly, Troy, N. Y.

KNITTING MACHINE CLOTH WHEEL OR Cloth Shoe. 753,074. Thomas P. Holloran, Utica, N. Y.

KNITTING MACHINE. Automatic Circular. 739,975. James F. Bard, Philadelphia, Pa.

KNITTING MACHINE STOP MOTION. 751,811. George W. Ruth, Norristown, Pa., assignor to Ruth Automatic Knitting Machine Co.

KNITTING MACHINE STOP MOTION. 750,225. George W. Ruth, Norristown, Pa., assignor to Ruth Automatic Knitting Machine Co.

KNITTING MACHINE STOP MOTION. 749,932. David H. Hill, Philadelphia, Pa.

KNITTING MACHINE STOP MOTION DEVICE. 750,147. Emanuel Wrigley, Woonsocket, R. I.

KNITTING MACHINE STITCH CAM. 749,672. Emil A. Hirner, Allentown, Pa.

KNITTING MILL NEWS.

New Mills.

New Jersey, Newark. The D. E. Knit Goods Co. at this place, manufactures sweaters for infants, boys and men. Max Guenther is manager of the mill, which is equipped with 24 flat knitting machines and 6 sewing and looping machines. Goods are sold direct.

New York, Brooklyn. Walter Schoebel, 101 Ralph St., manufacturer of full fashioned fancy knit goods, has started 25 knitting machines built by Dresdener Strichmaschinen of the latest type, which are adapted for the production of novelties in fancy patterns for sweaters and waists. One boiler. Capital, $10,000. Sells direct. Buys worsted yarn.

*New York, Little Falls. It is reported that Mr. Sheard and Mr. Senior are interested in a new company to be formed for manufacturing pineapple sweaters and overshirts. The company expects to start operations about April 1st in the old Sheard mill.

Pennsylvania, East Bethlehem. It is reported that work will start shortly on erection of a knitting mill, which will be managed by W. H. Jacobs, for the owners.

Pennsylvania, Philadelphia. The Girard Knitting Mills is the name of a new concern which started in business in June of last year. The mill is located at 10th and Susquehanna Avenue, and Mr. P. M. Yost, well known to the knitting trade, is the manager. They manufacture Tam O'Shanters on 8 knitting machines; employing 25 hands. The goods are sold through S. Cohen & Co., 78 and 80 Walker St.

Pennsylvania, Reading. C. G. and B. L. Kutz knitting mill is a new plant which started operations here February first manufacturing all kinds of ladies' hosiery (Maco foot a specialty). They operate 40 latch needle knitting machines and one sewing machine.

Wisconsin, Manitowoc. The Sheboygan Knitting Company of Sheboygan, has purchased the abandoned toy factory at this place and will equip same with machinery for manufacturing sweaters.

Enlargements and Improvements.

Alabama, Tuscaloosa. The Rosenau Hosiery Mills are to install machinery for making children's ribbed hose in addition to ladies' hose now made. The capacity of the plant will be increased from 500 dozen per day to 750.

Delaware, Wilmington. Mr. John L. Sutphen, proprietor of the Enterprise Hosiery Mills, 15th and French Streets, states that the increasing demand for his plain and fancy hosiery and half hose has compelled him to seek new and larger quarters. On March the 15th he will remove to the two story brick building, 30 by 45 feet, at 19th and Race Streets, which he has had entirely remodelled and in which he will put a new 10 horse power engine and an 18 horse power boiler. He is now so busy that it is necessary for him to run extra time to fill his many orders.

Michigan, Lansing. The Michigan Knitting Company has increased the capital stock from $25,000 to $50,000.

*New York, Camden. The Camden Knitting Co. has completed repairs on the storage warehouse recently damaged.

New York, Salem. The Salem Knitting Mills Co. has been incorporated with a capital stock of $100,000 by John P. Sheppard and Raymond and Sylvanus Sheppard. They will operate the Salem Knitting Mills, of which John P. Sheppard was formerly sole proprietor.

New York, Syracuse. The Oak Knitting Company is installing new machinery for manufacturing the finer grade of goods. They also contemplate building a warehouse in connection with the plant.

North Carolina, Malee. The Malee Knitting Mills Company has been incorporated with capital stock of $10,000, to operate the mill formerly run by G. C. Baldwin. Among the incorporators are: G. C. Baldwin, E. J. Ingram and James A. Ingram.

North Carolina, Valdese. The Waldensian Hosiery Company has installed ten Mayo knitting machines for making men's half hose. They now operate 35 knitting machines on children's, ladies' and men's hose.

North Carolina, Williston. It is reported that the Rosemary Knitting Mills Co. proposes increasing the capital stock to $30,000 and increasing the capacity of the plant. They will also double the capacity of the electric plant in order to furnish power to another factory and probably supply the town with electric lights.

Pennsylvania, Philadelphia. Julius A. Gebauer, for some time located at 4155 Frankford Avenue, has removed to Unity and Leiper Streets, Frankford, where he is occupying the entire first floor of the building owned by F. A. Bruner. Mr. Gebauer has his entire plant of 33 looms running full time on cotton, worsted and mixed men's wear, which he sells through Bacon & Co. and Bauendahl & Co., New York. He contemplates adding more looms.

Pennsylvania, Philadelphia. The American Textile Co., Church Lane and Lena St., Germantown, which has just removed their New York office to 52 Leonard St., are about to put in 10 Excelsior knitters, of a new pattern for the purpose of making 136 needle half hose, for which they have many orders.

Tennessee, Chattanooga. At a recent meeting of the stockholders of the Chickamauga Knitting Mills, Chattanooga, Tenn., it was decided to increase the capital stock to $50,000, and to put in additional machinery. The business of the company has been constantly increasing until the present equipment was found to be inadequate to the demand for their output.

Wisconsin, Milwaukee. The four story building being erected by G. Patek has been leased by the Columbia Knitting Company. It is expected that the new building will be complete about June 1st.

Mills Starting Up.

*New York, Mechanicville. The Mechanicville Knitting Company will resume operations February 15th.

Pennsylvania, Pennsburg. Operations have been resumed in the Pennsburg Knitting Mill, which has been idle for some little time. During idleness a steam heating plant has been installed.

Mills Shutting Down.

Pennsylvania, Philadelphia. Messrs. Fuhs Bros., who recently started in the business of manufacturing athletic goods and hosiery at 2306 Waterloo St., have given up the business. The machinery has been sold and Mr. Fuhs has taken a position as foreman in another mill.

Tennessee, Madisonville. The Madisonville Knitting Mills have been closed on account of the high price of cotton yarns.

Facts and Gossip.

Delaware, Wilmington. The Charles Taylor Company, 13th and Poplar Sts., manufacturers of men's, women's, boy's and misses' seamless cotton hosiery and fleeced hose, announce that business with them is booming. They have for several months been working both day and night in an effort to get out the orders which they have on hand. This mill employs 250 hands, operating 350 knitting machines. Goods are dyed and finished before leaving the mill.

District of Columbia, Washington. The Domestic Hosiery Mills have been incorporated with a capital stock of $6,500 by Wolfgang Richter. Gustave A. Lotham and Andrew McMillan.

Massachusetts, Lowell. The Hooper Knitting Company is running out stock preparatory to shutting down for the present.

New Jersey, Clayton. It is reported that nearly all the necessary stock has been subscribed for a new hosiery mill to be started here. William Williamson and Robert McKerghan are interested.

New York, Amsterdam. The partnership of the McFarlan Company is to be dissolved and the business wound up in order to settle the McFarlan estate. The mill is now closed but it is expected will be started up soon to run out stock on hand.

New York, Amsterdam. Henry Edmonds is reported as having purchased the Brookside Knitting Mill, formerly operated by the late Robert C. Wilson, and will start operations about April 1st.

New York, Cohoes. This city is feeling the uncertainty of the cotton situation, and many of the mills are running slack. The Root Manufacturing Company is running full time. The Orkney Mill is closed for repairs. F. W. Kavanaugh Manufacturing Company and Continental Knitting Company are idle, and the Mohawk River Mill is running out stock.

*New York, Cohoes. The assets of the Continental Knitting Co., which failed, are being sold at private sale.

*New York, Fultonville. A quantity of the material in the Sovereign Knitting Co.'s mill has been sold at receiver's sale. None of the machinery has yet been sold.

North Carolina. Elkin. W. C. Fields and associates are reported as making arrangements for establishing a large knitting mill here.

Ontario, Dundas. The Double Use Mitten Co. has been incorporated to manufacture all kinds of gloves and mittens. H. G. Smith of this place is attorney for the concern.

Pennsylvania, Philadelphia. A charter has been asked for by Messrs. Pilling & Madeley under the name of Pilling & Madeley, Incorporated; the names of the incorporators being as follows: Robert Pilling, Robert W. Scott, Louis N. D. Williams, Franklin N. Lyle and John M. Booth, for the purpose of manufacturing knitted goods. The mills are now located at Trenton Avenue & Huntingdon Street, in which they manufacture mens' and boys' ribbed hose.

Pennsylvania, Spring City. A charter has just been granted to W. C. Urner & Co. with capital of $350,000. The company manufactures full fashioned and seamless hosiery for ladies', men and children on 500 machines, a branch factory being located in Philadelphia at Indiana Ave. and A St.

*Tennessee, Morristown. The Wood Knitting Company has been incorporated with a capital stock of $10,000 to operate the mill started by the J. L. Wood Company. J. L. Wood and John B. Holloway are among the incorporators.

Personals.

Alva C. Farnsworth, Perry, N. Y., has accepted position of foreman latch needle knitter with the Pioneer Knitting Mills, Hamilton, O. He was with the Perry Knitting Co. for over ten years.

James W. Pilkington, late of Raleigh, N. C., has engaged with the Balfour Knitting Mills, Henderson, N. C., as boss dyer.

Ambrose Boardman, a machinist, employed for sixteen years by the New Britain Knitting Co., New Britain, Conn., died at his home February 23d. Mr. Boardman was 72 years of age.

A. Richtmeyer has succeeded John C. Mix as overseer of finishing at the Canasawacta Knitting Co., Sherburne, N. Y.

Albert Deabill, superintendent of the Lowell Hosiery Co.'s mill, Lowell, Mass., has resigned to become general manager of the Reading Hosiery Co., Reading, Pa.

George A. Bassett has resigned as carder and spinner with the Valatie (N. Y.) Knitting Company, and accepted the position of carder for James A. Hover, Columbiaville, N. Y.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

A New Towel. A patented knit towel is being put on the market by the Unique Knitting Co., First and Diamond Sts., Philadelphia, Pa., under the name of Red Cross towel. It is claimed to have great absorbing powers, is perfectly sanitary, easily cleansed and causes a friction of the skin, yet is not too harsh. It is particularly adapted for use as a bath towel and in hospitals, sanitariums, etc. It seems to be meeting with much success.

Fire Boxes for Boilers. McLeod and Henry Co., Troy, N. Y., are placing on the market a material known as steel mixture used for fire boxes and boiler door arches, which is claimed to be superior to ordinary fire brick.

Improved Tension Pulley. Stoddard, Haserick, Richards & Co., Boston, Mass., are introducing an improved tension pulley for worsted spinning frames. A description will be found in another part of this issue.

Card Feed. Franz Wolf, Neukirchen, Germany. A card feed for second breaker and finisher cards which overcomes the difficulty of fine and coarse threads. The improvement consists in greater facility for adjusting the feed.

Dyeing Machine. Hubert Roessler, Weisweiler, Germany, is placing on the market a dyeing machine operated by the circulating system. The circulation is maintained by a jet of steam which serves also to heat the liquor. The injector which keeps the liquor in circulation is placed on the outside of the dye tub. The vat itself is constructed like an ordinary dye tub and consequently the machine can be used either for dyeing by the circulating or by the old process. The circulating principle has already been employed with good results in this country.

Mercerizing Machine. C. G. Haubold, Jr., Chemnitz, Germany, is placing on the market an improved machine for mercerizing cotton yarn in the skein. Superior results are claimed for the new apparatus.

Warp Friction. Ernst Buschmann, Glauchau, Saxony, is placing on the market an improved warp friction device for looms. It is claimed that it can be regulated much more closely than previous devices and is not likely to get out of order.

Driving Worsted Spindles. Sachsische Kammgarn-Spinnerei, Harthau, Germany, have recently brought out a new arrangement for driving spindles on spinning frames. Two spindles are driven by one band; the friction of the spindle at the point of crossing is prevented by setting at different levels the whorls of the two spindles that are driven together.

Warp Dryer. Sachsische Webstuhlfabrik, Chemnitz, Germany, have recently brought out a device for regulating the temperature of the drying chamber of slashers in order to prevent its rising and injuring the yarn when the machine is brought to a standstill. Suitable arrangements are made for regulating the heat and circulation so that the temperature is kept uniform whether the machine is standing or running.

Heating Sizing Materials. Holden and Co., Accrington, England, have recently made an improvement in the method of heating size. It consists of a perforated spiral pipe placed in the bottom of the size trough. When the steam enters the size the pipe is revolved so as to distribute the steam in all directions and prevent any irregularity in the heating or mixing of the material.

Centrifugal Dyeing Machine. H. Schirp, Barmen-Unterbarmen, Germany, has recently brought out a dyeing machine for loose stock in which the liquor is forced through the material by a centrifugal pump.

A TENSION PULLEY FOR WORSTED SPINNING FRAMES.

The accompanying illustration shows an improved tension pulley for worsted spinning frames which Stoddard, Haserick, Richards & Co., 152 Congress St., Boston, are introducing into this country.

Ever since the adoption by Messrs. Prince Smith & Son of the tension pulley system of driving for worsted machinery spindles there have been numerous appliances suggested with a view of perfecting the method. Some of them have been quite ingenious, but in most cases sight has been lost of the chief requirements, viz.: Simplicity combined with effectiveness.

Messrs. Prince Smith & Son have found in their wide experience, which covers the whole world where worsted yarns are spun, that a light and absolutely true pulley running in simple, open, box-wood bearings gives the best results. They find that ball bearings as well as numerous styles of closed-in bearings, although good in theory, serve as a trap for the "fly" in ordinary practice and much difficulty has been experienced on this account.

There has arisen lately in the United States some demand for a closed-in bearing, and the tension pulley above referred to has been designed to meet this demand. The pulley bracket will accommodate either the open or closed wooden journal, and in addition is fitted with a sliding lid which covers the two bearings. The lid has neither springs, hinges, nor pins to get out of order or to cause any inconvenience to the machine attendant. The action of sliding the lid off and removing the pulley may be accomplished with one simple movement. After the pulley is replaced the lid will slide over the bearing automatically by means of its own weight. Wooden bearings, which are made from a variety of hard woods, are designed in such a manner that the "fly" will have a natural tendency to clear itself rather than collect and cause friction on the bearing surface. A hole for the lubricant has been provided on the top of the closed wooden bearing, in which grease, semi-solid wax, graphite sticks, or other suitable lubricant may be placed, although they have had them running for a long time without any applied lubricant whatever. As an additional precaution the wooden bearings may be soaked in oil, boiling wax or grease, and this method alone will produce a

OPEN.

CLOSED.

AN IMPROVED TENSION PULLEY.

sufficient lubrication for a long period.

The arrangement has already met with much success where it has been tried, and Messrs. Stoddard, Haserick, Richards & Co. will be pleased to submit a sample fixing.

At the time of the first Greek historian cotton manufacture was general in India and had attained a high degree of excellence.

THE "AMERICAN PIONEER" PRESSED STEEL SHAFT HANGER.

It is a matter of the greatest importance that the power transmitting machinery can be absolutely relied upon without making it unduly cumbersome and heavy. It is a well known fact among engineers and users of machinery that in most instances machines of today have to produce more, and work faster, or in other words, are under a greater strain than formerly. This means that transmission machinery is subjected to harder service than ever before. Naturally, therefore, we would think that the new conditions would have been taken into consideration and that additional strength and rigidity would have been provided for, but this is not so, at any rate not as far as the cast iron shaft hangers are concerned.

THE "AMERICAN PIONEER" SHAFT HANGER.

As competition grew keener, it became an absolute necessity to save wherever possible, and as reduced weight reduces the cost, the result is that cast iron hangers have been made lighter and in most cases weaker, at the same time as the work they have got to perform has grown more and more severe.

It happened and it does still happen that cast iron hangers break, probably due to the increase in load, but especially on account of their decreased strength. Cast iron is brittle and ought never to be used, if it can be prevented, in constructions where the forces will produce bending and tension. Iron castings are always more or less unreliable, as blow holes and other imperfections, invisible on the surface, may undermine the strength and safety of an apparently perfect article.

Let a pulley slip on the shaft, a bearing get hot, or a hanger break, and a whole shop, or at least a portion of it, will have to shut down until the trouble has been fixed. An untimely shut down always causes loss of time and money, in addition to a possible loss of life and property. It was by reasoning along these lines, and by thoroughly appreciating the importance of this matter that the "American Pioneer" pressed steel shaft hanger came into existence. Increased strength, if possible reduced weight, rigidity, complete adjustment, ease and convenience in handling, and last, but not least, absolute safety, all were demands which had to be satisfactorily dealt with before it could be claimed that the desired shaft hanger had been produced.

The illustration shows the four way adjustment pattern of the "American Pioneer" shaft hanger. It consists of two pressed steel legs each strongly ribbed and flanged throughout its entire length to insure rigidity combined with lightness, and so shaped at one end as to provide a broad and strong foot to form a solid base where bolted to the footing pieces, while the other end is quite narrow and designed to fit the lower cross piece or clamp, as shown. Ample bearing surface is provided for the bolts securing the clamps to the legs. Special attention has been paid to the proper distribution of metal, or in other words, maximum strength has been provided where maximum force is applied. A flanged and corrugated plate of pressed steel connects the two feet and is securely riveted to them so as to maintain their proper distance, and otherwise insure rigidity, stiffness and ease of handling. This plate being corrugated and flanged is very strong and stiff, although made of very light stock.

The brace connecting the two legs at the upper part of their parallel portions is made of pressed steel and strongly ribbed and

flanged, and can be considered as being in one piece with the legs, as it is riveted to each of them by six rivets, of the very best Norway iron. Besides acting as a brace and adding to the lateral and transversal strength of the structure, this part, as will be seen, also affords the means for taking the thrust transmitted through one of the vertical adjusting screws. The brace having deep and strong vertical sections is particularly well adapted to serve this purpose.

The clamp already mentioned is made of pressed steel and shaped so as to offer a strong U section with which to resist the bending movement due to the thrust of the other vertical adjusting screw, as will be clearly seen from the half-tone. The clamp fits outside the narrow ends of the legs in which it is secured by two fitted bolts. Beside taking the thrust as already referred to, the clamp also serves the purpose of tying the narrow ends of the legs together, thus greatly strengthening the whole structure, especially as the bolts are fitted. In this connection attention is called to the fact that by removing one of the bolts, securing the cap, this can be swung like a hinge with the other bolt for a fulcrum.

This feature is of great importance as it makes the fitting of the shaft and box in the hanger a very simple and easy operation. As it had been decided to place among other styles a four way adjustable hanger on the market, the question arose how to make a bearing which in its design would combine the advantages and good features of the ball and socket principle with those of the four way adjustment, at the same time being simple and strong of construction. The following description of the bearing shown in the illustration explains how this was accomplished.

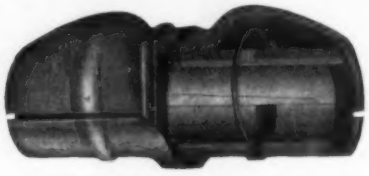
The bearing consists of three main and separate parts: An upper and a lower half bearing and an oil pan, all made of cast iron. On the top of the upper and on the bottom of the lower, these half bearings are fitted with spheres having their common centre in the centre of axis of bearing. A socket of the same radius as that of the spheres is fitted centrally on the inside and in the bottom of the oil pan, which is made large enough to keep sufficient oil for lubrication, and at the same time to accommodate the lower half bearing, while a recess located centrally on the outside of the oil pan is provided for the lower adjusting screw. Thus, when the complete bearing is put together and fitted between the adjusting screws, the two half bearings which bear on each other their full length, are supported on the socket in the bottom of the oil pan, and, as plenty of clearance has been provided between this and the half bearings wherever necessary to insure independent motion, these are left free to adjust themselves to fit the shaft, while the oil pan remains stationary, being firmly held by two horizontal and one vertical adjusting screw. The vertical adjusting screws are fitted in slotted holes, and can, therefore, besides providing for liberal vertical, also allow ample side adjustment, this latter being determined by the horizontal adjusting screws. To prevent the objectionable dripping of oil automatic wipers have been fitted.

THE "AMERICAN PIONEER" SHAFT HANGER.

This bearing is designed for ring oiling. The rings are made of tempered spring steel and will retain their original circular shape, thus insuring reliable and continuous lubrication. The hanger is also made to suit any other method of lubrication desired.

By inverting the hanger an equally suitable floor stand is provided for which can be claimed all the advantages enumerated in regard to the drop hanger just mentioned. In connection with the pressed steel drop hangers, a pressed steel post hanger or wall bracket is being made, the main feature of which resembles those of the hanger already described. It will be readily admitted that a wall bracket made of pressed steel is especially suitable, as its great strength against bending, as compared with cast iron makes it very desirable for this purpose.

The "American Pioneer" pressed steel shaft hanger has been thoroughly tested. As a result of these investigations it is now possible to make a hanger frame which, when stripped, weighs only 2/5 of the ordinary cast iron one intended for the same shaft and service; at the same time the strength of the steel frame is several times greater, besides being stiffer and more rigid throughout. With boxes complete, the ratio between the weights of the pressed steel and the cast iron hanger is as 1 to 2.



Considering that the steel hanger with box, etc., complete, only weighs about 50 per cent. of the corresponding cast iron hanger, it will be readily appreciated what a great saving in freight charges this means, which to the dealer means increased territory and increased business. When it is further considered that the steel hanger under ordinary conditions, at least, is unbreakable, one familiar with the transportation of machinery will understand how much this will facilitate the easy and rapid handling of these goods as compared with the breakable and much heavier cast iron hangers. In this connection it should be remembered that the steel hanger if thrown or dropped will not break, something cast iron hangers are very prone to do. Even in the event of a steel hanger getting bent, it is an easy matter to straighten it out again by the aid of a blacksmith's forge and a hammer, while a broken cast iron hanger is fit only for the scrap heap.

The pressed steel shaft hanger is patented in the United States and foreign countries, with several patents still pending to afford an effectual protection. The sole manufacturers of the "American Pioneer" pressed steel shaft hanger are the Standard Pressed Steel Co., whose offices and works are located at 20th and Clearfield Sts., Philadelphia, near the North Philadelphia Station, on the Pennsylvania Railroad. The company is always ready and takes special pleasure in furnishing prices and other information regarding the shaft hanger on application.

STRAIGHTENING MACHINE.

The accompanying illustration shows an inexpensive and very convenient machine tool, made by the J. T. Towsley Mfg. Co., Cincinnati, Ohio, which will save its cost in a short time, as one man can do 50 per cent. more straightening with it than two men can do with a sledge and anvil, besides avoiding the disagreeable noise and jar.

The base is one solid casting, 16 inches wide through the centre and 28 inches long,

THE TOWSLEY STRAIGHTENING MACHINE.

heavily ribbed and well braced. The "V" blocks are adjustable on a planed surface and will receive stock up to 2 1/2 inches diameter and 48 inches long.

The screw is of steel 1 15/16 inches diameter with square thread, five pitch, lathe chased. The nut is 4 1/2 inches long, tapped in the solid casting. The hand wheel is 12 inches in diameter with four cored openings to receive 7/8-inch steel bar for applying the pressure. A steel collar is placed between shoulder of screw and head piece, to reduce the friction.

The heads are adjustable on polished shaft

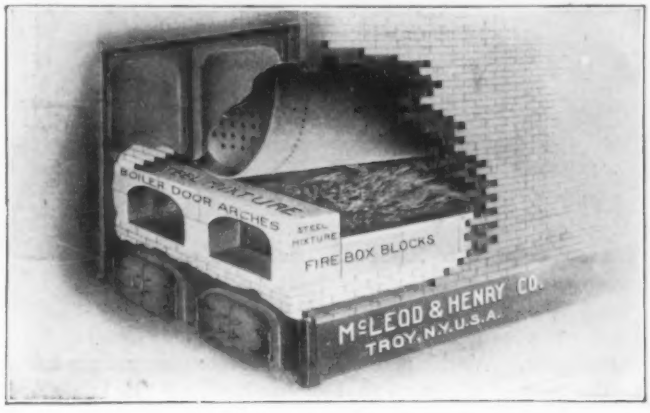
having keyway to keep them in line. One of the centres will spring back enough to receive the stock without changing the head. A convenient rod is attached as shown for resting the hand while chalking the work.

By using pieces of copper in the "V" blocks and under screw head, tools and finished work can be straightened in the most satisfactory manner.

Further information can be obtained upon application to the builders.

"STEEL MIXTURE" FIRE BOX BLOCKS.

A new material for the construction of fire-boxes and furnaces has been developed and is now made by the McLeod & Henry Co., Troy, N. Y. It is known as "steel mixture," and is formed in fire box blocks and boiler door arches ready for use. It is claimed to be stronger and more durable, as well as possessing higher heat-resisting properties than ordinary fire-brick.



The fire box blocks are tongued and grooved, and are made in sizes 12 and 18 inches high and 6 inches thick. When in place they make a wall the height of the fire all around the fire box, and this wall remains smooth and solid, whereas when ordinary small fire-brick is used there is often a tendency for the clay to shrink, thus opening spaces which encourage the accumulation of clinkers.

It is said the "steel mixture" arches will not fuse until a temperature of 4,000 degrees F. is reached, which is nearly twice the degree of heat that the iron furnace-door arches will stand. "Steel mixture" fire-brick has been applied extensively and is reported to have proved highly successful.

WATER PURIFICATION FOR INDUSTRIAL PURPOSES.

The accompanying illustration shows two independently connected pressure filters of two hundred thousand gallons daily capacity, constructed by the Philadelphia Water Purification Co., 1700 N. 12th St., Philadelphia, Pa. The filters are made in capacities ranging from ten thousand gallons to one million, eight hundred thousand gallons per day per unit, and are in use in a large number of textile mills where a very pure quality of water is required.

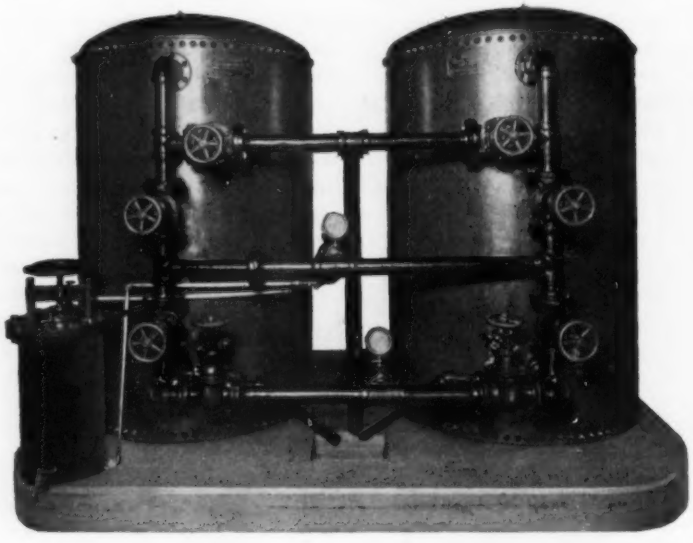
They are not only highly successful in the removal of silt from turbid waters, giving a clear effluent, but are also extensively used for the removal of such dissolved impurities as iron, vegetable matter, industrial wastes of various descriptions, etc.

A very important part of the filter is the reagent chamber and feed, a device for automatically injecting the exact amount of any suitable reagent to the water for the purpose of reducing the dissolved impurities to a form in which they can be retained by the filter. The reagents commonly employed are those which form insoluble compounds with the dissolved matter and are themselves removed by the filter.

The filters are practically automatic in operation. The water receives the correct amount of reagent (where a reagent is necessary) as it enters the filter and the speed of filtration and quantity of reagent are automatically regulated.

As the filter gets dirty the rate of flow diminishes slowly without any deterioration in the quality of the effluent. Washing is effected by reversing the flow of water so that it passes upward through the filter bed. By the aid of a number of devices known as sand valves, the granular filter bed is violently agitated, the bottom being brought rapidly to the top and at the same time the top part falls to the bottom through the rising layer. This action takes place many times in a minute and the attrition caused by this motion loosens the impurities from the filter bed and they are carried through the wash pipe to the drain. The washing process is so thorough that there never occurs the caking of the bed or the formation of mud balls so fatal to the efficiency of any filter. Washing is generally complete at the end of five minutes. Unfiltered water can be safely used for washing, as the filters are provided with an additional downward wash that removes any impurities that might have been brought in by the unfiltered wash water.

In machine dyeing where water is pumped through the stock without removing it from the machine, the stock itself forms an excellent filter, much to its own detriment. As a consequence, very excellent previous filtration must be resorted to to get good results. The peroxide process of bleaching similarly requires very bright water to obtain the best results.



A PAIR OF PHILADELPHIA FILTERS.

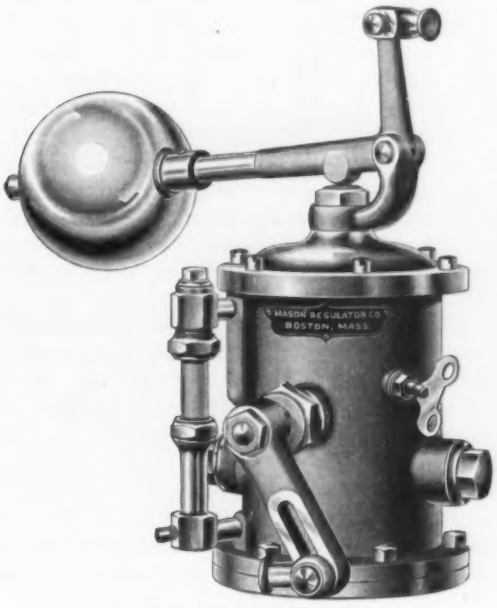
As an instance of the efficiency of these filters, a firm that has a large plant of this manufacture shows a picture they have taken of a red cross through eighteen feet of water. It was impossible to distinguish the cross through six inches of the water before filtration.

This company also manufactures continuous and intermittent water softeners for the purification of hard waters, also feed water purifiers, further particulars about which, as well as the filters, can be had upon application to the manufacturers.

Russia has been celebrated for its wools from time immemorial and grows the largest quantity of any European country.

THE MASON GOVERNOR FOR STEAM PUMPS.

To obtain a uniform discharge from a steam pump an efficient governor is essential. Without such a regulator of the speed,



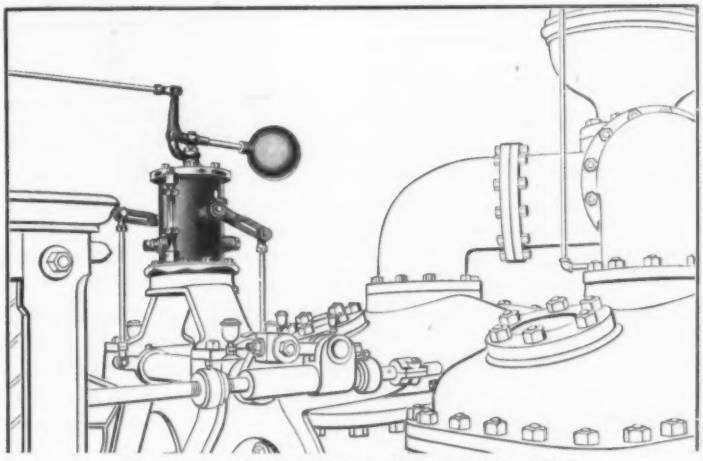
THE MASON PUMP GOVERNOR.

steam is wasted and unnecessary wear of the pump is caused by excessive variations of speed due to sudden changes of steam pressure or load. Consequently every direct-acting steam pump should be equipped with a regulator whether a uniform flow is required or not.

The Mason governor, manufactured by The Mason Regulator Co., 156 Summer St., Boston, Mass., has now been in use for fifteen years and while demonstrating its special merits has proved the general need of steam pump governors. The pump governor is to the direct-acting steam pump what the ordinary ball governor is to the steam engine and is in extensive use throughout the country. It is quick in action and very effective, and the manufacturers claim that it will continuously and instantly regulate any make of steam pump running under any variation of load or pressure. Its effectiveness has been demonstrated in repeated cases where the bursting of a discharge pipe has occurred, and the regulator has immediately controlled the action of the pump.

This regulator has been in use for so long a time and under such severe conditions that the manufacturers feel warranted in claiming that a pump regulated with a Mason governor cannot by any known combination of circumstances be made to race, but is always steadily held down to its work. It is easily adjusted to suit any desired change of speed and requires little or no attention when once it is in order.

It is conveniently placed so as not to interfere with free access to any part of the pump or governor. It is constructed with the fewest possible parts, each being



THE MASON GOVERNOR ON A DOUBLE ACTING ENGINE.

specially designed for strength and great wearing qualities; all its wearing parts are run in oil. It is practically indestructible and the manufacturers are confident that it will easily outwear any pump to which it may be attached. They will be glad to refer intending purchasers to very many firms in all branches of the pumping industry who know the positive working value of the machine.

THE MORRIS SPRING-BOTTOM DUCK BASKET.

The accompanying illustrations show the improved Morris duck basket made with steel frame and tubular joints. This basket, which is manufactured by Morris & Co., Groveville, N. J., has been subjected to hard usage in mills for over a year without disclosing any defects. In other respects

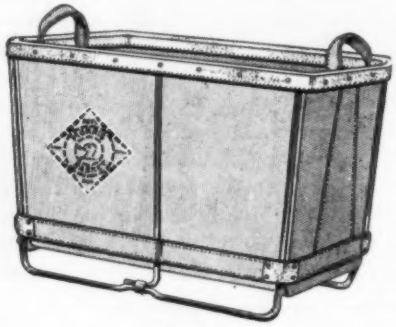


FIG. 1.

the basket possesses all the advantages of the old Morris basket which is so favorably known to the trade.

These baskets are made from the best high carbon steel and specially woven heavy duck, and it is believed they have all the qualities that go to make an economical and desirable mill basket, including strength, lightness, durability, ease in handling and elasticity that reduces the breakage of the contents to a minimum. The tubular joint is claimed to be much superior to the old welded joint. The tubing is made to fit the various sizes of steel, and this insures a smooth rim of the basket and joints that acts as a brace. This method enables the frames to be braced from any angle while at the same time allowing the use of the different sizes of steel for the different sized baskets to suit the strength required. This feature

FIG. 2.

is considered to be one of the very strong points of the new baskets.

Fig. 1 shows the round basket with folded corners and steel runners. All parts most exposed to wear are thus protected. The construction of the frame work is shown at Fig. 2. Fig. 3 shows the oblong Morris truck basket.

Morris & Co. also manufacture a basket specially adapted for steaming yarn in woolen mills. It is said not to be affected by heat or moisture. The sides and bottom

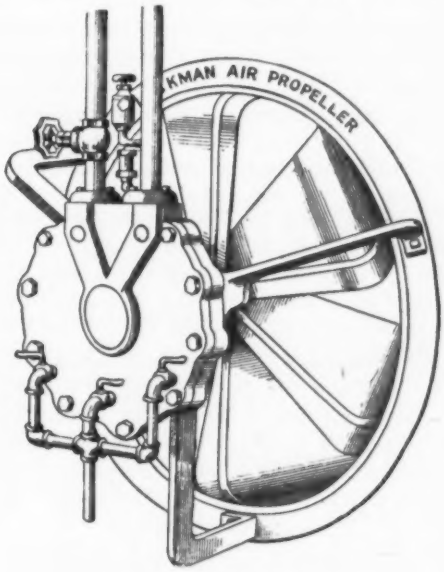
FIG. 3.

are provided with brass eyelets to allow a free circulation of steam at all points. This is a feature that will at once commend itself to manufacturers. Among the other baskets manufactured by this firm are the shipping basket, and the duck mill car or truck. The Morris basket contains no nails, screws or bolts and no wood. There is nothing to injure the contents, the baskets being perfectly smooth inside.

THE BLACKMAN FAN.

The matter of dye house ventilation is always an important one, and particularly so in the event of cold weather. This fact has been emphasized this season on account of the continued severity of the weather. Notwithstanding a great deal of experimenting and an expenditure of money, dye houses are almost invariably filled with a dense fog, rendering it difficult to do good work, as well as decreasing the amount of work the employees are able to perform.

While the problem seems to be an easy one, still the difficulty of keeping fans connected with belts and shafting, in proper



THE BLACKMAN FAN.

operation, well nigh discourages the dyer. The Blackman fan, with direct connected engine, as installed by E. M. Nichols, of Philadelphia, suggests some points of merits above the ordinary methods. The apparatus has the advantage of entire absence of belts, and of being easily controlled in its speed to accommodate the varying conditions. The engine is so constructed as to be practically indestructible, provided a moderate supply of oil is given. Several of these apparatus have been in use for from four to five years, and have never cost anything for repairs.

While these features are of excellent importance, they will not accomplish the desired results unless they are properly installed. The manufacturer claims some very satisfactory results in some recent installations, where the dye houses have been equipped with other apparatus. This has not always been accomplished by merely installing the ventilating apparatus, but also by judicious arrangement of the air supply. Very few dye houses are so situated but that this can be accomplished without any additional expense over and above the apparatus itself.

Mr. Nichols has had an extensive experience in installing and operating fans. This enables him to adapt the machines to varying conditions. He will be glad to hear from manufacturers who contemplate installing or changing fans, and is confident he can give them good results in this line of work.

Cotton in Australia.

Lancashire has discovered another region where cotton can be raised. It is Northern Australia, and a correspondent writing from Melbourne states that cotton plantations are being cultivated in various part of Northern Australia with very promising results. One small tract of fifteen acres at Cairns is expected to yield 2,643 pounds of cotton per acre. Considerable doubt is thrown on the accuracy of the report by the statement that the product is valued at twenty-four to thirty cents per pound. The difficulties in the way are thus stated:

> The chief difficulties which have to be faced before the new movement can attain success are three:—(1) The absence of thorough-going and comprehensive examination of the soil by English experts, (2) the nervousness of capital with respect to all Australian investments, (3) and the prohibition of colored labor. The last is by far the greatest stumbling block. At a meeting of the Royal Geographical Society, held in this city to discuss the question three days ago, it was suggested that the trouble could be met by forming a Tropical State into which colored labor could be imported to grow cotton, coffee, and sugar. Speakers urged the Federal Government to consider this solution of the white Australia question, and stated that capitalists would be prepared to submit to the strictest safeguards. I am afraid, however, that if cotton production is to be attempted at all in Australia in the present political atmosphere it will only be by the employment of white labor.

Dyeing, Bleaching, Printing, Etc.

PREPARATION OF WOOLEN PIECE GOODS FOR PRINTING.

The preparatory treatment of woolen piece-goods intended to be printed is an operation that requires a little care and attention to obtain uniform results and which, when once secured, is then only a matter of repetition. Upon good results in the white, the printer will be able to obtain at all times satisfactory prints, providing his colors run regular, and no changes or innovations have been made elsewhere.

The most serious trouble that can come to the printer is when mixtures of dyes are used, substituting a standard color, and one which is in all probability a straight color. While the purpose of the new combination of dyes is good, and is an exact match for the old color, yet the fact that it is a combination frequently leads to disastrous results that are beyond correction. The safest plan is to use only such dyes or combinations of dyes as are known to yield the desired results after going through all the operations, and to reject all others, no matter what their apparently good qualities may be.

SCOURING.

The fabrics must be well scoured before any other treatment is attempted, and the scouring should be so efficient as to remove all oils, dirt, etc., the object being to have the goods technically clean, so that, should any defects be noticed in the finished goods, they cannot be traced to the scouring. We will not describe the approved scouring process, as it is now well known, but we will insist upon a thorough rinsing afterwards to ensure removing the last traces of the scour liquors, an operation that should never be neglected.

BLEACHING.

The ideal process is based upon the use of either peroxide of hydrogen or peroxide of sodium, both of which have been described in the Textile World Record as applied to yarns, etc., but the principles are the same for woven goods—the details are as follows.

With peroxide of hydrogen: The goods are passed opened full width, through the bleach liquor containing from 10 to 30 per cent. of 12 volume peroxide, according to the grade of white desired, then roll the goods into a bolt and let them lie for 24 hours, after which they are passed through a bath containing from 10 to 30 per cent. of the 70° Tw. sodium bisulphite, allow to remain folded for a short time, and then give a run through acidulated water, and finally wash.

Another bleaching process using sodium peroxide is as follows: A bath is prepared containing 1 per cent. of Epsom salts (sulphate of magnesia) soak the wetted goods in this for a few minutes, then lift and add to the bath 10 per cent. of sodium peroxide on the weight of the goods, run the piece through this bath several times while the temperature is increased during one-half hour to 150° F., then allow them to remain submerged for 1 hour, lift, pass through a weak vitriol sour and finally wash.

Modifications of these processes are in use, but the above will be found to be the most practical. Of course the sulphur house process cannot be overlooked, but in the light of recent textile development this method is being regarded in the light of a nuisance.

CHLORING THE WOOL.

This is the most practical process for treating wool for printing; while other processes will be described, each of value within its own field, the chlorine process, when properly carried out, has no superior, and in the hands of careful workmen is simple in the extreme. The object of "chloring" the wool is to enable the fibres to take up a much greater quantity of dyestuff than they would otherwise, while at the same time the colors are most beautifully developed in brilliancy.

In chloring, however, a limit is reached when the wool appears yellowish in tone, beyond which the shades become dull, though remarkably heavy.

Two broad processes are in use, one using chlorate of soda, and the other, ordinary bleaching powder. This latter is of the greater importance.

The apparatus is a simple tank provided with a top and bottom row of rollers, and covered with a hood as shown in the accompanying cut, which explains itself. Its capacity may be conveniently 75 cubic feet, more or less, and holding, say, 550 gallons just over the top rollers.

The solution is made up with:

535 gallons water.
10 gallons chloride of lime solution at 10° Tw.
5½ gallons hydrochloric acid, 30° Tw.

After each batch of pieces have been passed through, the bath is strengthened by adding for each successive batch:

8 pints chloride of lime solution at 10° Tw.
3 pints hydrochloric acid 30° Tw.

and water to bring up to the original volume. After passing through this bath, wash well and dry, when the goods are ready for the printer.

A modification of the above process is to treat the goods in a bath of dilute hydrochloric acid contalning ½ pint of acid to 10 gallons water, and heated to 170° F. for ¼ hour, then through a cold bath containing from 3 to 5 pounds chloride of lime to each 10 gallons. Rinse thoroughly and dry.

The only objection to the chlorine process is that raised against the fumes, but by having a proper ventilator, this objection is removed. A mill doing this class of printing will construct a frame building specially for the preparing processes.

The acid and clear chloride of lime solutions should be kept ready for use in large stoneware tanks provided with suitable faucets.

In chloring, it is found in practice that the slower the operation proceeds, the better the results, as over-chloring is thereby avoided. It was the writer's intention to give the actual time for various classes of goods, but such would be of little value as each grade of cloth will depend much upon its weight per yard, kind of yarn and degree of whiteness of the preliminary bleach.

STANNATE OF SODA PREPARE.

This is a well known process. The essential details are as follows: The cloth is padded in a liquor at 5° Tw. of stannate of soda ("preparing salt"), let lie for 1½ to 3 hours, and pass through a bath containing:

20 ounces chloride of lime at 12° Tw.
4 ounces sulphuric acid, 66° Be.

to each 50 gallons water. The apparatus may be an ordinary padding machine of wooden construction, and containing as little exposed iron or other metal as possible.

After treating in the chlorine bath, the object of which is to fix the deposit of tin on the fibres, the goods are well washed and then dried, when they are ready for printing.

PRINTING.

The printing may be done on the dry chlored fabrics, or upon the same fabrics that have been dyed after chloring. This process is particularly useful for certain classes of striped goods. A good example of this work is as follows: The cloth, after chloring, is dyer with, say

2½ per cent. of Brilliant Cochineal 4 R
10 per cent. bisulphate of soda

in an ordinary dyeing machine, wash, dry and print with a color made up with an Acid Black, an Acid Green (to overcome the red showing through the black) and thickened with dextrine, and all made acid with oxalic acid and carrying a small quantity of ammonium oxalate. This gives a very contrasty effect of black and red, and when properly steamed is very fast.

DISCHARGE PRINTING.

For this purpose the several classes of azo colors are in use, both acid dyeing and substantive (direct dyeing) and the preparatory chlorine treatment is found to be eminently suitable for this purpose. It is found by comparative tests that by chloring the goods a saving is effected in the use of dyestuffs of an average of 25 per cent., a feature that will

commend this process to all interested, and where the color bills are high.

The discharge processes that are most used are:

(a) Tin crystals discharge for white and colored effects.

(b) Zinc dust discharge for white effects.

The most approved and practical formulae for the tin discharge are as follows:

TIN CRYSTALS WHITE DISCHARGE NO. 102.

Boil together:

60 parts water.
30 parts wheat starch.
24 parts white dextrine.
3.6 parts tartaric acid, and add
36 parts tin crystals, and when cold, add
9 parts acetate of sodium.

Another good white discharge is:

DISCHARGE NO. 41.

Boil together:

60 parts acetate of tin, 28° Tw.
18 parts wheat starch.
24 parts white dextrine.
3.6 parts citric acid, and add
36 parts tin crystals, and when cold, add
4.5 parts acetate of sodium.

After printing, steam for about 10 minutes, and wash.

ACETATE OF TIN DISCHARGE NO. 51.

Boil together:

60 parts acetate of tin, 28° Tw.
15 parts wheat starch.
45 parts white dextrine.

Print, steam without pressure, and wash.

In compounding these "colors," the starch should always be worked cold in either the water or acetate of sodium to make a smooth paste before boiling.

ZINC DUST DISCHARGE NO. 14.

Grind well together:

200 parts zinc dust (best quality and fresh).
375 parts dextrine solution (1:1), and before use, add
62½ parts bisulphite of soda, 75° Tw.

Or, the following may be used:

ZINC DUST DISCHARGE NO. 1.

Grind well together:

160 parts zinc dust (best quality and fresh).
200 parts gum water (1:1).
27 parts glycerine, and before using, add
60 parts ammonia, 23° Be.
30 parts bisulphite of soda, 75° Tw.

Print, steam without pressure for ½ to 1 hour, and pass through a weak sulphuric sour, and wash.

These various white discharge processes may be modified within certain limits and without increasing the cost at any stage. Of the two zinc discharges, No. 1 is the best, although it is slightly more troublesome and costly to make—its results, however, are excellent.

PREPARATION OF SILK FOR MORDANT COLORS.

In reply to the question on the above subject from an inquirer, we present the following notes, which, though not to be regarded as being complete, will no doubt aid in throwing some light on the subject.

As a rule, silk is not mordanted for such colors, but in some few instances there appears to be a demand for this class of work upon a small scale.

Aluminium Mordant. For each gallon of water necessary to work the silk in conveniently, dissolve 10 ounces of alum and 1 ounce of soda crystals, and heat until the precipitate which forms is redissolved. Enter the silk and work for 15 minutes, and then immerse completely in the liquor for 12 hours. Lift, wring out, and work for 15 minutes in a cold bath of silicate of soda at 1/2 deg. Tw. Wring out, wash well, wring again, and dye without previous drying.

The alum bath may be used continuously by being brought up to strength with more alum and soda. Aluminium acetate or the nitro-acetate may be used at a strength of 12

degrees Tw. with equal results. Another process for aluminium is as follows: To 10 gallons of water dissolve 10 lbs. alum and 4 lbs. hyposulphite of sodium. Soak the silk in this for 3 or 4 hours, heating during the first hour to 100 degrees F.; during the second hour to 140 degrees F., and during the third hour to 175 degrees F. Lift, wash and dye.

Chromium Mordant. This mordant is always preferable where heavy shades are wanted. The boiled-off silk is immersed for 6 hours in a solution of chloride of chromium made as follows:

Bichromate of potash ....21 parts
Bran ..... 4 1/2 parts
Muriatic acid ..... 18 parts

warm gently and add in small portions at a time

Muriatic acid ..... 34 parts

and when all action has ceased, add

Soda crystals, 6 parts, dissolved in water 12 parts.

Strain and use the clear solution.

After being immersed in this solution, the silk is removed, wrung out, and passed during 15 minutes through a silicate of soda bath at 1/2 degree Tw., washed, squeezed, and dyed without previous drying.

Chrome mordanted silk may be used for all chrome colors including logwood. It imparts but very slight weight to the silk, while it makes the colors extremely fast.

It should be realized that there is a very weak affinity of the silk for the metallic salts, and it is only by a little experience that the best results are to be obtained, especially with chromium.

The colors dyed upon such mordants are much faster on silk than either the azo (acid) colors or the basic colors, and dyers should give the process greater attention than it now receives.

THE DYEING OF SLUBBING.

For many purposes this method of dyeing wool possesses advantages that are not shared in dyeing either raw stock or yarn, and since the chrome mordant colors have reached their present high state of perfection, it is possible that slubbing dyeing will greatly increase. The present general lines of chrome colors permit of two broad methods of application. One is to mordant the material, and in the same bath proceed with the dyeing, or—and this seems to be the more desirable process—to add the dyestuff and the mordant to the bath, while a few isolated types of colors may be applied by first dyeing and to the same bath add the mordant which is either bichromate of potash or chromium fluoride.

Without specifically enumerating any particular line of products, those most available to the dyer are the alizarine or anthracene yellows, browns, blacks and blues, not to mention logwood or the various types of hematines which are always standard for this class of work, especially so as they work very well with any combination of mordant colors of the types above mentioned.

In all cases where chrome colors are to be applied to wool, it is important to correct any hardness that the water has, and to this end about 2 to 3 ounces of ammonic oxalate may be used to each 10 gallons of water, to which is added about two quarts of acetic acid and the previously dissolved dyestuff. The bath is brought near to boiling and at this temperature the goods are entered when the steam is turned on and the bath kept boiling for about 1/2 hour. The bath is exhausted by adding about 3 per cent. of sulphuric acid, followed by the proper quantity of bichromate of potash, which for blacks will be about 1 1/2 per cent. Lift, wash and soap.

The standing kettle is used by entering the fresh batch of goods and giving a half hour's boil, followed by the dissolved dyestuff and the other ingredients as above mentioned.

When blacks are dyed continuously, the best practice is to maintain a separate chroming kettle, as it will greatly facilitate the work, and will also effect some economy in the cost of dyeing. This separate chrome kettle is maintained with the addition of only 3/4 per cent. of bichromate for each batch.

When dyeing browns and similar combinations, the slubbing is entered at about 120 deg. F., prepared with the ammonic oxalate and the dyestuff, and after 10 to 15 minutes,

raise the temperature during 1/2 hour to about 180 deg. F., then add 2 per cent. acetic acid and continue dyeing at the boil for 3/4 to 1 hour. The bath is exhausted by the gradual addition of 3 per cent. of acetic acid followed by the bichromate of potash, which is usually half the quantity of the dyestuff. After dyeing, wash well and soap.

The standing bath is utilized by employing it in the same manner as described for blacks.

Upon chrome mordanted material, the various types of products belonging to the gallocyanine, prune and indochromogene groups are of special interest, as they go on the stock somewhat rapidly, but give very level results, and when worked in combination with alizarine yellow, alizarine maroon and logwood, give a very wide range of shades of extreme fastness. When light to medium shades are wanted, especially such as are not to be subjected to extreme light exposure tests, the acid colors are to be recommended. To apply them the bath is prepared with

Glauber's salt ..... 10 per cent.
Acetic acid ..... 2 per cent.

The goods are entered at 150 deg. F., and dyed at the boil for 3/4 hour, and the bath is exhausted by the addition of a further quantity of 5 per cent. of acetic acid.

It is not necessary to refer here to the direct colors as being suitable to this class of work, their chief quality being in their great fastness to milling. The best process for dyeing them is as follows:

Prepare the bath with 20 per cent. of cryst. Glauber's salt and the proper quantity of coloring matter. Enter the slubbing at 100 deg. F. and dye for 20 minutes. Then raise the temperature to the boil and continue for 20 minutes additional. In most cases the bath can be exhausted by adding about 3 per cent. of acetic acid. Light shades can be obtained without acid, as the baths exhaust completely.

THE DYEING OF WOOL AND MERCERIZED COTTON FABRICS.

Various figured effects are obtained by using mercerized cotton for the design element upon a plain ground of wool, both being dyed one shade. Of course, it is possible to dye each set of yarns the same shade before weaving, but from the manufacturers' point of view, it is cheaper and more economical to dye the goods in the piece.

Mercerized cotton, compared with ordinary cotton takes up a greater quantity of dyestuff from the bath, which alters slightly the method of dyeing this combination of fibres, but the following process will be found to meet almost every condition that might arise.

Prepare the bath with 4 pounds of crystallized, or 2 pounds calcined glaubersalt for each 10 gallons of water, and for each succeeding lot of goods add 12 ounces of the former or 6 ounces of the latter to each 10 gallons.

Previously dissolve the dyestuff in a pail, and strain into the bath and boil up thoroughly; shut off the steam and enter the goods, which may be dry, letting them run for 1/2 hour, during which time the cotton is seen to take up a considerable amount of color, while the wool appears to be quite light. In order to bring up the shade of the wool, increase the temperature of the dye bath to the boil, and work the goods at this temperature until the color comes up to the proper depth.

As a rule it is a distinct advantage to have the wool slightly fuller in tone than the cotton, as it tends to give a decided contrasty effect.

The dyeing is best done in any open width dyeing machine, but a very simple contrivance is a winch mounted over an open kettle, and arranged on guide so that it may be pushed from one end of the kettle to the other.

The choice of dyestuffs for this class of work will always be the direct or substantive dyes, but it may be occasionally necessary to make an addition of a small quantity of an acid color to give the proper degree of brightness to the wool color, while at the same time the direct color is not influenced by this treatment.

Many handsome specimens of upholstery goods are dyed by this method, and the results are of a very high order.

THE USE OF ACID BLACKS AND LOGWOOD IN THE SAME BATH.

While logwood, as a black dye for wool, has now been completely displaced by the acid blacks, many of which are excellent, and for some classes of goods meet every requirement, there arise instances where combinations of the two dyes might be used in the production of handsome shades.

The following formula, based upon extended experience in dyeing worsteds, ladies' cloth, eskimo, cheviot and worsted-cheviot with this process will convey a very good idea as to its adaptability:

Logwood extract	8	lbs.
Wool black (acid color)	4	lbs.
Copperas	5	lbs.
Bluestone	2½	lbs.
Oxalic acid	2½	lbs.

The logwood is first added to the dyebath and boiled thoroughly, followed by the copperas and bluestone, then with half the oxalic acid, and the acid black previously dissolved in hot water.

Enter the goods, boil for one hour or more, and observe the color of the dye liquor, which, when it is exhausted, should have a clear amber color. If it does not, additional quantities of oxalic acid should be given until the desired result is obtained.

Instead of ordinary logwood extracts, the hematines can be used with very good results. Originally chipped logwood was used but as it is saving considerable time to use the dry or paste products, these latter have the choice.

The results obtained by this process are excellent, the shade is full and bloomy, and when finished is the equal of chromed stock, while the cost is much less.

The cloth should be well scoured and washed to remove all traces of soap, so as to ensure level results. Any tone or reasonable modification of shade can be easily made by using a fast acid yellow, a fast acid red, or an acid green with the acid black, without altering the dyeing process.

The first cotton imported into the English market from Egypt was in 1823.

CORRECTION.

Attention is called to the fact that the statement that Domingo Chrome Brown G. No. 178 in the December issue, and Domingo Chrome Brown B, No. 13, in the January issue, refers to the shade produced without after treatment. When after treated with potassium bichromate as indicated the shades produced are extremely fast to light and fulling.

Sericulture in France.

Notwithstanding the subsidy granted by the French government in 1892 on all silk raised in France amounting to 4 1/2 cents per pound, which was increased to 5 1/2 cents in 1898, the industry is still declining. At present the aggregate paid out on account of this subsidy is about $900,000 per year. At the recent session of the French Chamber of Deputies the following requests were made to the Minister of Agriculture:

1. To furnish mulberry plants to the farmers to replace those that had been destroyed. 2. To establish public ovens in each commune. 3. A grant of $19,000 to indemnify the agriculturists for losses. 4. To remit taxes until 1898 on all land planted with mulberry trees.

The Bulletin de la Chambre Syndicale des Tisseurs of Lyons, France, gives its approval to the second of these requests and states that it should have been granted long ago. That journal remarks that it is well known that the cocoons cannot be kept over twenty days as after that time the chrysalis pierces the cocoon, which is then useless for spinning. The spinners take advantage of that fact to force the raisers to sell at a low price. The ovens are all owned by the spinners, who will not put them to the service of the silk cultivators, who are thus left at the mercy of the buyer.

The Minister of Agriculture has responded favorably to the first three requests and reserved his decision on the fourth. Notwithstanding the large subsidy the quantity of graine used in France has fallen from 205,000 ounces in 1901 to 198,000 ounces in 1902, a decrease of 7,000 French ounces, by which cocoons are still weighed in France.

New Color Cards.

Immedial Brilliant Black, Cassella Color Co., 182 Front St., New York City.

Four samples of cotton yarn, two of cotton piece goods and two of mercerized cotton dyed with different percentages of Immedial Brilliant Black.

Dyeings on Linen Yarn; Cassella Color Co., 182 Front St., New York City.

One hundred and twenty eight shades of linen yarn dyed with Diamine and Immedial basic colors.

Shades fast to light on Mercerized Cotton Goods; Berlin Aniline Works, 213 Water St., New York City.

Twenty-one shades on mercerized voile for which formulas and full dyeing directions are given.

Direct Brown O O O; C. Bischoff & Co.; 88 Park Place, New York City.

Two samples of raw cotton, two samples of cotton yarn and two of cotton piece goods dyed with different percentages of Direct Brown O O O.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation Subscription price for the Dyers' Supplement $1.00 per year

Recipe No. 33.

Blue on Cotton Yarn.

Columbia Blue R on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Columbia Blue R.
(Berlin Aniline Works, 213, 215 Water St., New York.)
25 lbs. Common Salt.

Enter yarn at 170° F., and dye at a boil for one hour.

Columbia Blue R dyes evenly, possesses good coloring power, and will be found an excellent direct cotton color.

Recipe No. 34.

Black on Cotton Yarn.

Pluto Black T G Extra on 100 lbs. of cotton yarn. Prepare the dye bath with

5 lbs. Pluto Black T G Extra.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
40 lbs. Glauber's Salt.
2 lbs. Soda Ash.

Enter at 170° F., bring to boil and dye at a boiling temperature for one hour.

Pluto Black T G Extra produces a deep and bloomy shade of black. It is well adapted to the dyeing of loose cotton, cotton yarn and piece goods, and for half wool and half silk.

Recipe No. 35.

Red on Cotton Yarn.

Tetrazo Purpurin R on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Tetrazo Purpurin R.
(New York & Boston Dyewood Co., 156 William St., New York.)
25 lbs. Common Salt.

Enter yarn at 170° F., bring to a boil and dye at a boil for one hour.

Tetrazo Purpurin R is noteworthy for its good fastness to light and acid. It works very well for the dyeing of union goods.

Recipe No. 36.

Dark Olive on Cotton Yarn.

Thional Olive N on 100 lbs. cotton yarn. Prepare the dye bath with

9 lbs. Thional Olive N.
(Thomas Leyland & Co., 53 India St., Boston.)
15 lbs. Sodium Sulphide Crystals.
5 lbs. Soda Ash

previously dissolved in water.

Add the above to the dye bath which contains

250 gallons of Water.
50 lbs. Common Salt.

Raise to the boil and when ingredients are thoroughly dissolved enter yarn and dye for one hour. Subsequent lots will require two-thirds of the quantities of material used for the first bath.

Thional Olive N will be found useful in the production of fast mode shades. It is extremely fast to acids, alkalies, washing and light.

The fastness to light can be slightly increased by an after-treatment for one-fourth hour with

2 lbs. Potassium Bichromate.
2 lbs. Copper Sulphate.
1 lb. Acetic Acid.

Recipe No. 37.

Brown on Cotton Yarn.

Thiogene Brown 2 G R on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Thiogene Brown 2 G R.
(Herman Metz & Co., 122 Hudson St., New York.)
5 lbs. Sodium Sulphide (Crys.)
3 lbs. Soda Ash.
30 lbs. Common Salt.

Dye one hour at a temperature of from 175° to 195° F., rinse well and dry.

Thiogene Brown 2 G R requires no after-treatment as the direct shade is very fast. The after-

treated shade is some faster, however. The dyestuff is very soluble and therefore suitable for mechanical apparatus.

Recipe No. 38.

Blue on Cotton Yarn.

Benzo Fast Blue 5 R on 100 lbs. cotton yarn Prepare the dye bath with

3 lbs. Benzo Fast Blue 5 R.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
35 lbs. Glauber's Salt.
2 lbs. Soda Ash.

Enter yarn at 180° F., and dye at a boil for one hour.

Benzo Fast Blue 5 R gives an excellent shade of reddish blue, and possesses the usual characteristic properties of direct cotton colors.

Recipe No. 39.

Yellow on Woolen Yarn.

Mercerol Wool Yellow R on 100 lbs. woolen yarn. Prepare the dye bath with

3 lbs. Mercerol Wool Yellow R, dissolved in boiling water.
(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

The material is entered cold, the bath raised to a boil in half an hour, and the dyeing continued at the boil for half to one hour, when the dye bath is well exhausted, more acetic acid being added if necessary.

Mercerol Wool Yellow R may be applied to loose wool, slubbing, yarn or piece goods, is fast to light, milling and rubbing, and possesses all the good qualities of the mordant colors.

Recipe No. 40.

Blue on Worsted Yarn.

Xylene Blue B S on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Xylene Blue B S.
(Sykes & Street, 85 Water St., New York.)
2½ lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Xylene Blue B S gives a very brilliant shade of blue, which is quite fast to light and soaping.

Recipe No. 41.

Scarlet on Worsted Yarn.

Ponceau 6 R B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Ponceau 6 R B.
(New York & Boston Dyewood Co., 156 William St., New York.)
15 lbs. Glauber's Salt.
3 to 4 lbs. Sulphuric Acid.

Enter at 150° F., bring slowly to a boil and dye at a boil for one hour.

Ponceau 6 R B produces desirable shades of bright, bluish red on wool and is also especially adapted for dyeing cotton with alum and Glauber's salt.

Recipe No. 42.

Black on Worsted Yarn.

Empire Black A S on worsted yarn. Prepare the dye bath with

5 lbs. Empire Black A S.
(F. E. Atteaux & Co., 176 Purchase St., Boston.)
4 lbs. Acetic Acid.
20 lbs. Glauber's Salt.

Enter yarn at 120° F., bring slowly to a boil and boil 45 minutes, then add

1 lb. Sulphuric Acid.

Boil 30 minutes longer and add.

1 lb. Potassium Bichromate.

Empire Black A S is very fast to scouring and light.

Recipe No. 43.

Brown on Cotton Yarn.

Cotton Brown G on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Cotton Brown G.
(E. M. Thayer & Co., 106-112 Broad St., Boston.)
50 lbs. Common Salt.

Enter goods at a boil and continue boiling until the desired shade is produced.

Cotton Brown G produces shades very fast to light, and may be after-treated with potassium dichromate and copper sulphate, thus rendering the shades still faster.

Recipe No. 44.

Claret Red on Worsted Yarn.

Domingo Alizarine Claret B on 100 lbs. of worsted yarn. Prepare the dye bath with

4 lbs. Domingo Alizarine Claret B.
(C. Bischoff & Co., 88 Park Pl., New York.)
15 lbs. Glauber's Salt.
3 to 4 lbs. Sulphuric Acid.

Enter at 140° F., bring to a boil and dye at a boil. When the dye bath is exhausted add

3 lbs. Potassium Bichromate

and boil one-half hour longer, then wash thoroughly and dry.

Domingo Alizarine Claret B gives shades which are extremely fast to sunlight, fulling, acid, alkalies, and sulphur bleaching. It is a perfect substitute for alizarine and takes much less time.

Recipe No. 45.

Black on Cotton Yarn.

Thional Black G O on 100 lbs. cotton yarn. Prepare the dye bath with

11 lbs. Thional Black G O.
(Thomas Leyland & Co., 53 India St., Boston.)
35 lbs. Soda Crystals.
1 quart Caustic Soda, 60° Tw.,

previously dissolved in 10 gallons of water.

Add the above to the dye bath, which contains

250 gallons of Water.
5 lbs. of Soda Ash.

Raise to a boil and add 50 lbs. of common salt. When ingredients are thoroughly dissolved enter yarn and dye at a boil for one hour.

Lift, rinse thoroughly and brighten in an olive oil and soap emulsion.

For subsequent lots only 6 lbs. of color dissolved as above, and salt to keep up the density of the bath will be required.

Thional Black G O is a highly concentrated S black and perfectly fast without after-treatment.

Recipe No. 46.

Blue on Worsted Yarn.

Xylene Blue V S on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Xylene Blue V S.
(Sykes & Street, 85 Water St., New York.)
2½ lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Xylene Blue V S gives a very brilliant shade of blue, which is quite fast to light and soaping.

Recipe No. 47.

Blue on Cotton Yarn.

Immedial Indone R R Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

8 lbs. Immedial Indone R R Conc.
(Cassella Color Co., 182 Front St., New York.)
20 lbs. Sodium Sulphide Crystals.
6 lbs. Soda Ash.
10 lbs. Glucose.
20 lbs. Common salt.

using about two gallons of water for every pound of yarn dyed.

It is best to dye on bent iron rods for one hour at about 120° F., then to squeeze well and to level by wringing rapidly. For the production of even shades it is essential to squeeze carefully and wring evenly. After dyeing, the yarn is allowed to hang in the air one-half to one hour.

For subsequent lots, if the same bath is used, it is only necessary to strengthen the bath with the following additions:

4½ lbs. Immedial Indone R R Conc.
10 lbs. Sodium Sulphide Crystals.
2 lbs. Soda Ash.
4 lbs. Glucose.

Immedial Indone R R Conc. is extremely fast to light, washing, crocking and cross dyeing.

Note. By an error this color was shown in the December number under the name of Immedial Indone 3 B Conc. We would call our reader's attention to the fact that the recipe and sample given in the present issue are correct.

Recipe No. 48.

Brown on Cotton Yarn.

Thiogene Brown S on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Soda Ash.
30 lbs. Common Salt.

Then add

8 lbs. Thiogene Brown S.
(Herman Metz & Co., 122 Hudson St. New York.)
4 lbs. Sodium Sulphide Crystals

previously dissolved with water.

Boil the bath a few minutes to insure complete solution, then introduce yarn, well wet out, into boiling bath, shut off steam and dye three-fourths to one hour in the gradually cooling bath.

After-treat with

2 lbs. Potassium Bichromate.
2 lbs. Copper Sulphate.
3 lbs. Acetic Acid

at 170° F.

Piece goods can be dyed in a jigger, the dyestuff being added in two ends and the amount of salt reduced. In every case the goods should be well squeezed upon leaving the dye bath, to insure fastness to rubbing.

Thiogene Brown S is extraordinarily fast to light, alkalies and rubbing. In piece dyeing it gives pure lists.

Finishing Compounds.

A very complete line of finishing compounds is offered by the Arabol Manufacturing Company, 100 William street, New York, for use on bleached, dyed and printed piece goods. Besides starches and sizings, soluble oil, etc., of their own manufacture, the Arabol Company handle china clay, talcum dextrines, chloride of magnesium, and imported potato starch.

Asala Co. Moves to Larger Plant.

The Asala Company have found it necessary, owing to the growth of their business, to remove their works to larger quarters at Slatington, Pa., where they have more adequate facilities. They will maintain a New York office at 415 Broadway, and inquiries sent to either address will have prompt attention.

Mill News.

COTTON.

New Mills.

California, Napa. The California Woolen Mills have been organized to operate a quilt factory. They have leased the building formerly operated as the Napa Woolen Mills. J. D. Ladley is to have charge of same.

Massachusetts, Worcester. The Lancaster Lace Works is a new concern recently organized with a capital stock of $50,000 and which will start operations in about two weeks manufacturing lace. Alden A. Mills is general manager and superintendent of the works; John E. Lancaster, president, and Joseph P. Lancaster, treasurer.

New Jersey, Camden. Articles of incorporation have been filed by the Burnada Company, a new concern, the purpose being to manufacture cotton, velvets and other fabrics, the capital being $25,000. The incorporators are Adam Fink, well known as a manufacturer of damasks in Frankford, Pa.; James C. Haigh and William Davies.

*New York, Poughkeepsie. The Northern Wadding Company, whose plant at West Park has been destroyed by fire, will erect a new building at this place. They contemplate having same in operation by May 1st, employing thirty people and manufacturing glazed wadding and cotton bats. The company is capitalized with a capital stock of $50,000 with Louis Patek, president, and J. L. Grotta, superintendent.

*North Carolina, Dallas. Work has been completed on installation of an electric light plant in the Morowebb Cotton Mill. The entire equipment of the plant is now in operation.

*North Carolina, Hickory. Work has just been completed on equipment of the Ivey Mills. Concern awaits markets to start. Will operate 4,500 spindles and 200 looms, on yarns, 40s and 48s and making sateens.

South Carolina, Anderson. It is reported that that Delaware Mfg. Co. of Wilmington, Del., has recently issued $100,000 worth of new stock for purpose of erecting and equipping a new mill at this place. The equipment will consist of about 12,000 spindles and it may be decided to instal weaving machinery also.

*South Carolina, Hartsville. The Hartsville Cotton Mills will start their new mill in July '04. This mill will be equipped with 20,000 spindles and 550 looms.

Enlargements and Improvements.

Alabama, Anniston. A large addition is to be built to the Woodstock Cotton Mills and weaving machinery installed, for manufacturing fancy damasks. At present the plant is run on yarns exclusively.

*Georgia, Griffin Work will be started about April 1st on erection of a new addition for the Griffin Manufacturing Co. They contemplate having same completed about November 1st. Will instal 10,000 additional spindles and about 400 looms. Plant is now equipped with 16,500 ring spindles and 593 looms.

Georgia, Moultrie. The Moultrie Cotton Mills have increased the capital stock from $100,000 to $175,000.

Georgia, Winder. The Winder Cotton Mills Co. will increase the capital stock to $150,000, and will greatly enlarge the present capacity of the plant.

*Georgia, Eatonton. Messrs. J. B. & A. B. Floyd, recent purchasers of the Eatonton Electric Cotton Mills, will enlarge capacity of same and instal new machinery. Plant will be known as the Puritan Cotton Mills & Electric Co., and will be operated by water power electrically transmitted. A new building 100 by 150 feet, will be built and equipped with 200 looms for weaving duck, osnaburgs and other coarse cotton goods. It is expected to have the plant in full operation about September 1st.

*Louisiana, New Orleans. The Lane Mills will start their new addition, in which 30,000 spindles and 700 looms will be installed, about May 1st, 1904.

Maine, Saco. The York Mills, which have greatly increased the capacity of the plant during the past year, have begun removing considerable machinery to the upper floor of No. 1 mill, where one story addition was built last summer. About 300 new looms are to be installed.

Massachusetts, Bondsville. The Boston Duck Company is installing a new Lowell slubber in the carding department.

Massachusetts, Fall River. A meeting was held Feb. 29th by the stockholders of the Davis Mills, at which the capital stock was increased from $500,000 to $600,000, for purpose of increasing the machinery to 50,000 spindles. The new mill, which is now in full operation, was originally planned for an equipment of 50,000 spindles. It is understood that all of the machinery contracts have been placed.

*Massachusetts, Lawrence. The Arlington Mills are installing additional looms in the weaving department. The burling and mending rooms have been moved to the new mill on Broadway, thus giving increased space for weaving purposes.

*Massachusetts, Westfield. R. H. Kneil is president of the Planet Manufacturing Co., which recently secured control of the Columbia Thread Company, and will operate both mills as the Planet Manufacturing Co. Robert Gowdy is treasurer and A. M. Schappa, general manager. Plant has capacity of 10,000 lbs. of glazed thread per week.

Massachusetts, Whitinsville. An addition will be built in the spring by the Paul Whitin Mfg. Co. for a weaving room.

*New Hampshire, Nashua. The new addition, 196 by 30 feet, two stories, of the No. 1 Mill of the Jackson Company has been completed. It has

been built for the purpose of removing the pickers to one floor and arranging for more floor space for additional machinery to meet the demands of sale of new style goods now being manufactured. Six new automatic feeders have replaced the old willow machines.

North Carolina, Charlotte. H. A. Cook & Co. have sold their batting and bagging mill at this place to L. W. Sanders and Jasper Miller, who propose making a number of improvements and increasing capacity by installation of new machinery.

New York, Cohoes. The Harmony Mills have purchased about 180 of the looms formerly operated in the Wild Mills.

North Carolina, Dallas. The Dallas Cotton Mills will discard their old Franklin cards and replace same with Whitin revolving flat cards.

North Carolina, Edenton. The Edenton Cotton Mills will add about 5,000 spindles to the plant this summer.

*North Carolina, Lumberton. The Lumberton Cotton Mills have started up the new machinery recently installed.

North Carolina, Roxboro. The Roxboro Cotton Mills are reported to make arrangements for enlarging the plant during the year.

North Carolina, Willardville. The Willard Manufacturing Co. has closed the mill temporarily for purpose of making some repairs to the machinery.

Pennsylvania, Philadelphia. Richard C. Campbell, manufacturer of damasks in the Dale Mill, Gillingham St., Frankford, reports being very busy operating six looms. He states that he is about to start up on novelties within a short time for which it will be necessary for him to purchase a few more looms. The goods will be sold direct.

South Carolina, Anderson. The directors of the Cox Mfg. Co. held a meeting recently at which it was decided to double the plant. The capital stock will be increased to $200,000 for the purpose of making the improvements. They will make an addition of about 12,500 spindles for manufacturing fine grades of yarns.

*South Carolina, Clinton. Work is nearing completion on the No. 2 Mill of the Clinton Cotton Mills. When completed this plant will have a total of about 70,000 spindles.

*South Carolina, Pacolet. The Pacolet Mill No. 3, partly destroyed by the flood last June, is about completed and ready to resume operations as soon as the cotton conditions warrant doing so.

South Carolina, Yorkville. The Tavora Cotton Mill Company is erecting a brick office building near the site of the present wooden one and they also contemplate erection of a number of new cottages for the operatives.

*Tennessee, Humbolt. The Humbolt Cotton Mills, recently reported having voted to increase the capital stock for purpose of doubling the present equipment, will start work on erection of addition about June. They will install 5,000 new spindles and expect to have same ready for production of goods about September. They manufacture yarns 18 to 26 and sheetings.

Texas, Brenham. It is reported that the Brenham Cotton Mills contemplate doubling the capacity of their present plant of 160 looms.

Texas, Waxahachie. The Waxahachie Cotton Mills, which contemplate adding manufacture of towels to present output, have installed a few initial looms for trial and if found successful, will make large addition.

Mills Starting Up.

*Massachusetts, South Hadley Falls. At the meeting held recently by the Glasgow Manufacturing Company, it was voted to change the name to the Hadley Mills and to increase the capital stock from $150,000 to $300,000. C. Fayette Smith was re-elected president and treasurer of the company. About fifty of the looms are now in operation.

Mills Shutting Down.

Delaware, Wilmington. The Delaware Cotton Company has closed the mill until the condition of the cotton market is changed.

New Hampshire, Dover. The No. 5 Mill of the Cocheco Mfg. Company's plant has been shut down indefinitely.

New York, Stapleton. The Richmond Manufacturing Company's plant has been bought by the Syndicate and the mill has been shut down. It is doubtful if the plant will ever be used again for a wadding mill.

Pennsylvania, Philadelphia. William Hartley, who some months ago commenced the manufacture of all wool Smyrna rugs at 2306 Waterloo St., has discontinued business and gone back to designing at which he made quite a reputation before starting out as a manufacturer.

Rhode Island, Bristol. Preparations are being made for closing the Namquit Cotton Mill, for an extended time, as bobbins and yarn from the carding and spinning departments are being made ready for shipment to other mills.

WOOLEN.

New Mills.

Connecticut, Dayville. Prescott Brigham, formerly interested with William Taylor in the Taylor Woolen Company, Spencer, Mass., has purchased the Elmville Woolen Mill at Danielson and will operate the same. Frederick Kimball, former superintendent of the Elmville Woolen Mills, will again assume that position with Mr. Brigham.

Indiana, La Porte. The Clear Lake Woolen Mills, King & Fildes Co., proprietors, are not running at present. Plant is equipped with ten sets cards.

Maryland, Banks. The weaving mill at this place has been leased by the Art Square Company, which will start operations about the first of April.

*Massachusetts, Lowell. The new rug mill for the Bigelow Carpet Company, for which plans were reported as being prepared last October, will

be 300 by 129 feet, six stories. We understand no contracts for the building have yet been signed and that it may be some time before work is begun. The Lowell Machine Shop has prepared the plans.

Ontario, Toronto. The Canada Wool Stock Co. has been incorporated with capital stock of $20,000 by H. J. LeFevre, H. C. Gwyn (Dundas), J. M. Ewing and B. Osler. They propose manufacturing woolen and cotton waste, shoddy and wool stock, blankets, etc.

*Pennsyvania, Harrisburg. The Harrisburg Woolen Mill has started operations in their new plant, making blankets. Eighteen looms have been installed.

*Pennsylvania, Philadelphia. Geo. E. Potts is president of the Philadelphia Felt Co., Ltd., recently organized to manufacture paper makers' felts, laundry and printers' cloths. F. S. Christian is treasurer of the company; F. S. Potts, secretary and Geo. A. Spencer, general manager. Plant is located at Adams and Emerald Sts. Goods will be sold direct.

Pennsylvania, Philadelphia. The new plant of William Ellison & Son, manufacturers of plain and fancy dress goods in the Mornington Mills, Bradford, England, will be called The Ellison Mfg. Co., and will be located in the Sidebotham Mills, Franklin and Church Sts., Frankford, where they will run on the same class of goods with 100 looms, 30 of which are almost ready for operation. Harry Lonsdale, who has been with firm for some years in England, will have entire charge of the establishment in this country and is now in Frankford getting the mill in shape for operation.

*Wisconsin, Appleton. Operations will be started about March 1st in the branch mill established here by George McArthur & Son, of Baraboo. Rugs, from old carpets, will be made. Plant, which will start with 4 looms, will be enlarged, if found successful.

Enlargements and Improvements.

California, Missouri. The California Woolen Mills, which increased their capital stock last April from $15,000 to $135,000, have now erected a new brick and stone building, 129 by 67 feet, into which they are now removing. They will put in additional machinery, such as steam presses, wool washers, mules and three more "Knowles" looms. This mill has been in operation since 1875 manufacturing flannels, dress goods, yarns, blankets and skirts. Mr. F. Hugelman, the president and superintendent, is now in the East for the purpose of looking over and buying machinery for their new plant, which is expected to be in operation by March 1st.

*Canada, P. Q., Beauharnois. The Dominion Woolen Mfg. Co. has completed installation of 20 broad Knowles looms in the plant.

Connecticut, Mystic. The Mystic Manufacturing Company has placed order for six additional looms to be installed in the mill. This will fill up all the available space in the mill.

Connecticut, Thompsonville. Plans have been completed by the Hartford Carpet Corporation for the erection of two additional mill buildings, each 200 by 80 feet, three stories high.

Kentucky, Louisville. The Louisville Girth and Blanket Mills have been incorporated with a capital stock of $30,000.

Massachusetts, Adams. Graham, Clark & Co., which have been making various improvements to the mill, will build a 30,000 gallon tank on a steel trestle in the spring. This mill has been equipped with electricity.

Massachusetts, Clinton. Ten new looms are being installed in the Bellevue Mills. This will give them a total of thirty.

Massachusetts, East Dedham. The Cochrane Carpet Mfg. Co. is installing some moquette looms in the mill. The new office building, which is nearing completion, will be ready for occupancy in about two weeks.

Massachusetts, Fall River. The old machinery in the No. 2 mill of the King Phillip Mills is being replaced with new, Whitin cards and Woonsocket Machine and Press Co. speeders being installed. At the No. 1 mill, 32 Whitin frames are replacing mules.

Massachusetts, Pittsfield. The J. L. & T. D. Peck Mfg. Co. has received installment of 25 looms which are being set up. A new extractor has also been ordered.

Minneapolis, Rushford. An addition 40 by 50 feet is to be erected for W. W. Webster, successor to J. Webster & Company, proprietors of the Rushford Woolen Mills. Two sets of cards and two mules will be installed.

New Mexico, Albuquerque. The Rio Grande Woolen Mills are to enlarge the plant. Blankets are made.

New York, Dryden. L. W. Huyck of Emlenton, Pa., has purchased an interest in the Dryden Blanket Mill and is to instal new carding and spinning machinery in same. Mr. Huyck will be manager and superintendent of the plant.

Ohio, Cleveland. The Cleveland Worsted Mills Co., which is building a new machine shop, will start work at once on erection of a new mill, in which they will instal 40 more looms.

*Ontario, Elmira. Additional machinery has been ordered by the Elmira Felt Co.

Ontario, Guelph. The Guelph Worsted Spinning Company is installing a new set of cards and mules in the plant for making carpet and hosiery yarns.

*Ontario, Guelph. The Guelph Carpet Mills Company has recently installed a tapestry and velvet carpet plant in the mill. An addition 175 by 50 feet, three stories, for office and stockroom and one, 125 by 50 feet, to the loom-shed have been built.

Ontario, Seaforth. Additional machinery is being installed in The John Dick Co.'s mill.

Ontario, Streetsville. The National Woolen Mills are installing an additional set of cards in the plant.

Pennsylvania, Clifton Heights. New broad looms are being installed in the Thomas Kent Manufacturing Company's plant for making blankets.

Pennsylvania, Philadelphia. Plans have been prepared for an addition, 113 by 178 feet, two and three stories, to the J. S. Dunlap Carpet Co.'s mill.

Pennsylvania, Philadelphia. More room being needed for their increasing business, the Mustin, Davis Co., which started in the business of manufacturing tapestries at 306 Master Street, on four looms, about one year ago, have removed to larger and more up-to-date quarters at 1548 Ruan St., Frankford, where they have greatly increased their mechanical capacity.

Pennsylvania, Philadelphia. Messrs. Stearns & Castor, the well known mill architects and engineers, located in the Stephen Girard Building, 12th, above Chestnut Street, are preparing plans for an additional story, 60 by 220 feet, and interior changes to the two-story factory building of Thomas Wolstenholme Sons & Co., Frankford Avenue and Westmoreland Street, manufacturers of worsted yarns on the French and English systems.

Pennsylvania, Philadelphia. The Unity Woolen & Worsted Co., Unity and Leiper Sts., Frankford, which started up several months ago with 10 looms, have recently put in 20 more, with warping, twisting and winding machinery. Mr. Barras, the superintendent and manager, states that they are very busy with many orders still coming in. They manufacture plain and fancy worsteds.

Mills Starting Up.

*Connecticut, Shelton. Operations have been started by S. Blumenthal & Co. making woolen goods. The silk and velvet business is also reported as promising.

Maine, Dover. Operations have been resumed in the Brown Mill of the American Woolen Company which has been closed about two weeks.

*Massachusetts, Athol. Operations have been again resumed in the Millers River Mills Company's plant recently shut down.

Massachusetts, Winchester. Operations have been resumed in the Bacon Felt Mill by Charles N. Bacon who succeeds Bacon Bros.

Oregon, Albany. Operations have been started in the Albany Woolen Mills by the Bannockburn Woolen Mill Company, making fine cloth for suitings. When this company purchased the mills, they were leased immediately to the Oregon City Company, which closed the plant about three months ago, and it was thought that the mills would remain closed.

Mills Shutting Down.

Massachusetts, Monson. The Cushman Mill is to be shut down as soon as the stock on hand is run out.

Massachusetts, Uxbridge. Albert Davis, owner of the Ironstone Mill is disposing of the machinery in the plant and will retire from business.

Rhode Island, Providence. The Rhode Island Worsted Mills, manufacturing fine worsted yarns, are shut down indefinitely.

KNIT.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

*Connecticut, Manchester. Operations have been started in the new silk mill established here by Matchett Bros., Forty looms have been installed.

*Connecticut, Norwalk. It is expected that about ten of the looms will be started up in the Mueller Gloria Mills within two weeks.

*Massachusetts, Farnumsville. Dexter, Lambert & Co., of Paterson, N. J., large silk manufacturers, purchased The Farnumsville Cotton Mills at the sale. It is stated that new machinery will be installed for manufacturing silk goods and that the mill will be placed in operation a soon as possible.

*New Jersey, Little Falls. The Killin Silk Company has been organized with a capital stock of $100,000 to operate the plant formerly owned by Fogle & Killin. James H. Killin, Jean C. Neagli and John W. Winkhaus are the incorporators.

*New York, Hamilton. At the meeting held recently by the Board of Trade the amount required for building of the new silk factory and purchase of site was pledged.

*Pennsylvania, Erie. Thirty looms are being installed on the second floor of the Continental Rubber Company's plant for the Erie Silk Mills recently reported to be established here. A new building 200 by 70 feet, two stories, will be built and will be equipped throughout for spinning, weaving and finishing the goods at the mill. At the present quarters, only spinning, doubling and weaving are done. It is expected that operations will be started up shortly.

Pennsylvania, Philadelphia. The General Artificial Silk Co., whose main office is in the West End Trust Building, 32 South Broad St. and factory at Lansdowne, Pa., has started a branch factory in the Wagner Mill, Toronto Junction, Ont., Canada, in which they are manufacturing artificial silk under a patented process. The company is very busy, finding a market for all the silk they can turn out.

Enlargements and Improvements.

New Jersey, Paterson. The Barbour & King Company has been incorporated with a capital stock of $10,000 by Samuel A. Barbour, Nathaniel King, A. W. Barnes and W. J. Ellison. They will operate the plant formerly run by Barbour & King.

New York, College Point. The Myhnepo Silk Mills are to be wired with electricity.

New Jersey, Trenton. The entire mechanical equipment of the American Silk Manufacturing Company at Eden, Pa., has been removed to this city where they are now occupying quarters in the

building occupied by the Colonial Woolen Co. The company manufactures raw silk products, machine wipes, etc., on eight looms.

Pennsylvania, Shamokin. Additional looms are being installed in the Shamokin Silk Mill.

Mills Starting Up.

Connecticut, Gurleyville. Operations have been resumed on full time in P. G. Hanks' silk mill.

New Jersey, Paterson. The Potts & Meredith Silk Co. is removing its plant to the Totowa mill, where they will increase the looms from 20 to 50.

*New Jersey, Paterson. The Ashley & Bailey Silk Company will reopen the ribbon and dyeing departments in about a week or ten days.

MISCELLANEOUS.

New Mills.

*Canada, Ontario. The Canadian Linen Works has been incorporated under Nova Scotia laws with a capital stock of $500,000. This undoubtedly refers to the Dominion Linen Mills Company reported last October at Orilla and in which J. H. Pauley of Halifax is interested.

Rhode Island, Hope Valley. The New England Linen Company, whose office is in Providence, has purchased the old Hopkinton Mill at Rockville, near Hope Valley, and will equip same for manufacturing yarn from imported flax. About fifty people will be employed. Work will start at once on installation of special machinery and operations started as soon as possible. Charles W. Bowen is president of the company; R. J. Reeves, vice-president and general manager and J. Irving Davis, secretary and treasurer.

*Rhode Island, Hopkinton. The New England Linen Co., capitalized at $150,000, will start production of flax yarns No. 6 to 18 lea, about May 1st. Charles W. Bowen is president of this company; J. Irving Davis, treasurer; Richard J. Reeves, vice-president and general manager, and J. M. Hathaway, superintendent. The goods will be sold direct. Company's office is at Providence. Have not yet secured all the necessary equipment.

*Washington, Seattle. Preliminary work has been started by the Portland Cordage Company for erection of a new plant in which about $350,000 will be invested.

Enlargements and Improvements.

Connecticut, Jewett City. Plans are being prepared by the Jewett City Textile Novelty Co. for the erection of a new building, 175 by 50 feet, three stories, brick, for calendering, tentering, mercerizing and finishing departments.

Massachusetts, Attleboro. R. Wolfenden & Sons are to increase their spooling, coning and stock rooms with a new building 100 by 40 ft. and two stories high, and they are also to add for that department a new 50 H. P. engine and other requirements.

Massachusetts, Fall River. The Swansea Dye Works Company is installing an electric light system in the mill.

Mills Starting Up.

*New York, Greenwich. The Linen Underwear Company has started operations in their new mill.

Mills Shutting Down.

Connecticut, Norwich. The Norwich Processing Corporation is financially embarrassed and the business will doubtless be wound up and creditors receive a small dividend.

Pennsylvania, Philadelphia. Several months ago a bleachery of raw stock, cotton, etc., was started at York and Mutter Streets by James Buchannan. The business is no longer in existence, the plant having been dismantled and the machinery returned to the builders.

Pennsylvania, Philadelphia. The dyehouse of the old E. H. Godshalk Co., at 24th & Hamilton Streets, has been taken over by new parties, with Mr. E. H. Godshalk being one of the interested parties. It has not been decided as yet under what name the plant will be run, but it is expected to be in full operation within a month. Cotton, woolens, worsteds, piece goods, silk, flax and jute, will be dyed, bleached and finished. Mr. Bell, the former superintendent of this department for the E. H. Godshalk Co., will have full charge.

FAILURES AND SUSPENSIONS.

Massachusetts, Adamsdale. John F. Adams, owner of the Adamsdale Mill, has made an assignment. The liabilities are placed at $58,600, $47,000 being secured. There are also contingent liabilities as executor of $25,000 and assets of $53,000. The mill has been closed.

Massachusetts, Clinton. The Clinton Worsted Company, William and John Rodger, Jr., proprietors, has made an assignment. The assets are placed at over $200,000. A meeting of the creditors will be held in Boston March 2nd, up to which time at least, the mill will be kept in operation.

New York, Brooklyn. Franklin E. Saunders has filed a petition in bankruptcy against the Mayhew-Dynan Silk Co., his claim being a judgment for $1,781.44, the execution of which was returned unsatisfied on February 9th.

New York, New York. Charles H. Hamilton, doing business as Charles H. Hamilton & Co., manufacturers' agent in woolens and dress goods, has made an assignment to Harry S. Hicks.

Pennsylvania, Collegeville. The Perkiomen Knitting Mills Co., Ex-Burgess William Todd, Jr., and Herbert C. Spooner, co-partners, has been adjudged bankrupt. The liabilities are placed at $13,811.14, with assets of $11,489.

Texas, Waco. T. M. West and others have filed a suit in the District Court against the West Cotton Mills, asking for foreclosure of venders' liens, aggregating $87,000 with interest and attorney's fees, making a total of $100,000. It is thought that operations will continue after the difficulty is adjusted.

FIRES.

Massachusetts, Auburn. The Pondville Woolen Company's plant has been damaged by fire which started in the picker room. The loss is principally from water in the picker and stock rooms. The plant is shut down pending adjustment of insurance.

Massachusetts, Canton. The Eureka Silk Manufacturing has been damaged by fire, which was confined in the basement to the extent of about $25,000; covered by insurance.

Massachusetts, North Billerica. One of the smaller store-houses of the Talbot Woolen Mill has been destroyed by fire; covered by insurance.

New Jersey, Paterson. Ashley & Bailey's large silk mill employing 1,500 people has been destroyed by fire; the loss in estimated at$150,000.

New York, West Park. The Northern Wadding Company's mill has been destroyed by fire. The loss estimated between $15,000 and $20,000 is partially covered by insurance. It is not yet known whether or not the plant will be rebuilt.

Oregon, Portland. The Portland Woolen Mills have been destroyed by fire. Loss is estimated at $150,000 with $100,000 insurance.

Pennsylvania, Philadelphia. The Hall Packing & Wiping Waste Manufacturing Company's mill on Hermitage Street has been destroyed by fire. The loss is placed at about $15,000.

Texas, Denison. The Denison Knitting Mill has been destroyed by fire. The loss is estimated at $25,000 and partially covered by insurance.

FACTS AND GOSSIP.

Alabama, Birmingham. A new concern, known as the Coosa Water Power Development Co., is being organized at this place with capital stock of $250,000, for purpose of developing water power and building an electric plant for transmission. A number of industries, including a cotton duck mill, which Eastern capitalists propose erecting, are to be established. The Industrial Finance & Trust Co. is reported as financing the project.

Alabama, Fayette. It is reported that Eastern capitalists have made a proposition to local business men to establish a cotton mill of from 15,000 to 20,000 spindles and that same may prove favorable. Benjamin Bell of the Providence Mills Co., Philadelphia, is mentioned as interested.

Colorado, Denver. Dallas J. Osborne of this place, has purchased a large site and has plans underway for erection of a large wool scouring plant.

Connecticut, Stafford. The Phoenix Woolen Company is operating their mill four days a week.

Connecticut, Willimantic. The Windham Mfg. Co. and the Willimantic Cotton mills are running evenings at the present time for purpose of filling orders.

Georgia, Atlanta. M. J. Franklin, 373 Pryor Street, is making efforts to induce capitalists to locate a cotton mill in Georgia.

Georgia, Columbus. It is reported that Northern capitalists are proposing erection of a $250,000 cotton mill at North Highlands, and that they are now carrying on investigations relative to the enterprise. E. N. Clemence of this place is mentioned as interested.

Georgia, Cuthbert. Efforts are being made by the Board of Trade to secure location of a cotton mill here. If certain propositions which have been made, are accepted, a $100,000 plant will be established.

Iowa, Dubuque. The National Linen Company of this place is reported as negotiating with the town of Anderson, Ind., relative to removing the mill to that place.

*Kentucky, Louisville. V. B. Semple is president of the Louisville Girth & Blanket Company, Inc., with a capital stock of $30,000. A. B. Semple, vice-president, secretary and treasurer, and C. B. Semple, superintendent. It is stated that later on the company may be interested in purchasing second hand machinery for spinning cotton yarn, which they now purchase from 3s to 10s.

Kentucky, Paris. A new hemp manufactory has been started here by Speirs and Son.

Maine, South Berwick. William R. Noone and Company have incorporated with a capital stock of $50,000 for manufacturing woolen and cotton goods. C. M. Hobbs is president and treasurer.

Massachusetts, Chicopee. The Dwight Manufacturing Co. will operate their No. 1, 2, 3 and 4 mills, five days a week for an indefinite time, on account of the cotton market.

*Massachusetts, Chicopee. The Burtworth Carpet Company has as yet made no decision concerning contemplated removal of the plant.

Massachusetts, Fall River. No. 2 mill of the Sagamore Mfg. Company's plant is being operated but four days a week.

Massachusetts, Gloucester. Hon. Sylvanus Smith has been elected president of the Gloucester Net & Twine Co. A new brick office building is to be erected for the company.

*Massachusetts, Holyoke. An informal statement of the Holyoke Thread Company's affairs has been filed by the assignees. The assets are estimated at $27,562 with liabilities of $18,000. The assignees propose selling the property.

Massachusetts, Holyoke. The Lyman Cotton Mills have started operating the coarse goods department four days a week owing to the high price of cotton.

*Massachusetts, Monson. Thos. G. and Henry W. Lancey have purchased the Golden Rod Woolen Mills from L. R. Rosenberg. It is stated that they contemplate operating same.

Massachusetts, New Bedford. A special meeting will be held by the stockholders of the Butler Mill to consider increasing the capital stock from $1,000,000 to $1,250,000.

*Massachusetts, South Hadley Falls. J. S. McElwain has been elected president of the Hadley Mills and C. W. Dennett is vice-president and general manager.

Massachusetts, Spencer. Simon Taylor and H. Prescott Brigham operating as the Taylor Woolen Company have dissolved partnership. Mr. Taylor will continue the business.

Massachusetts, Webster. The S. Slater & Sons Company has reduced the capital stock from $3,000,000 to $2,500.00.

*Massachusetts, West Millbury. The insurance has been adjusted on the Ramshorn Woolen Mill and work has begun on repairs. Thos. Wendell who operated the mill at the time of the fire, will give way to Edwin Hoyle, proprietor of the plant, who will manufacture goods for the Mayo Woolen Mill Company.

*Mississippi, Meridian. We have been advised by the Board of Trade that the parties interested in cotton mill have not yet decided upon location of plant, nor has all of the stock been subscribed.

*New Hampshire, Portsmouth. An advice received from the Board of Trade states that nothing has yet been done concerning the projected mill by Massachusetts parties.

New Jersey, Camden. The Philadelphia Worsted Co.'s mill, which is in the hands of a receiver, will be sold on the 27th inst. Parties from the West are in Philadelphia to bid at the sale.

New Jersey, Camden. The Diamond Tip Lace Company has been incorporated with a capital stock of $100,000 for the purpose of manufacturing cotton and silk goods. Joseph T. Moriarty, Margaret W. Heinhist and Ralph W. E. Donges are interested.

*New Jersey, Clifton. The Barclay Silk Company's mill at this place has been sold at auction by Fred C. Barnes, trustee in bankruptcy, to Rudolph Cohen of New York, who holds the second mortgage on the plant.

*New Jersey, Haledon. The Haledon Tapestry Co., recently reported incorporated, succeeds Fulton, Smith & Co. Wm. Robertson is president of the company, and Geo. W. Fulton, treasurer.

New Jersey, Trenton. Operations have been resumed in the Alryan Woolen Company's mills with about half the usual working force. It is stated that operations will be resumed with full force as soon as the Delaware River warrants their so doing.

New York, Hartwick. The Borated Specialty Company has been incorporated with capital stock of $5,000 for the purpose of manufacturing chemically treated cloths. C. D. Donahue (New York) and H. O. Saunders (Brooklyn), are interested.

New York, New York. The Kahlizog Silk Company has been incorporated with capital stock of $15,000 by E. A. Pfeiffer, E. H. Woodward and W. H. Taubert, who are interested.

New York, New York City. The Michigan Central Woolen Co., Centreville, Mich., has just opened up an Eastern office at Nos. 1-3 Union Sq. for the sale of their high grade knit underwear, Thos. P. Booker having charge of the office. Mr. Booker also represents the Lewis Knitting Co., manufacturers of the "Lewis Jersey Fitting" underwear, which is meeting with much success in this section.

*New York, West Sand Lake. At a meeting held by the creditors of J. and R. McLaren, Michael F. Sheary was appointed trustee and empowered to continue the business until the sale, which it has been voted to hold on April 4th.

North Carolina, Ashville. The Ashville Cotton Mills have discontinued running the plant on Saturdays. This action has been taken owing to the condition of the cotton market.

North Carolina, Earl. E. S. Thomason and J. L. Surratt of Gaffney, S. C., are mentioned as interested in project reported under way to build and equip a new mill at this place.

North Carolina, High Point. J. Edward Cox is reported as making efforts to secure establishment of a large cotton mill at this place. Mr. Cox is corresponding with an experienced mill man who offers to invest $125,000 in the project, provided a like amount is subscribed locally.

Ohio, Cleveland. G. H. Showen of Marion, Ohio, is reported as interested in a project on foot for establishing a silk mill at this place. Berlin (Germany) capitalists are interested.

Ohio, Cleveland. The Forest City Woolen Mill Co. has been incorporated with capital stock of $25,000. Wm. E. Patterson, C. Kopf, N. Rogers and Wm. F. Atterholt are interested.

Ontario, Bulock's Corners. The Clark Blanket Co. has been incorporated with capital stock of $40,000 to continue operating the A. & J. Clark mill. Among the incorporators are: J. Alex Clark, F. P. Thornton and J. Allen Clark.

*Ontario, Dundas. The Empire Carpet Co., which quite recently started operations at this place, is in the hands of creditors. The plant is advertised for sale by the trustee. It is stated that an effort will be made to secure new capital and reorganize the company.

Ontario, Toronto. The Smith Manufacturing Co. has been incorporated with capital stock of $40,000 to continue the Smith Wool Stock Co.'s business. Geo. Smith, G. Herbert Smith and J. A. Burns are interested.

Pennsylvania, Bloomsburg. The Magee Carpet Works have been damaged by the floods which prevailed in that section.

Pennsylvania, Chambersburg. David Appenzellar is now proprietor of the Chambersburg Woolen Company's Mill.

Pennsylvania, Downington. William Souls' Sons, who for many years run the Rockstone Mills at Downingtown, Pa., have given up their interest in the business. The mills are now controlled by a stock company, the officers of which are: D. W. Northrup, president; M. M. Northrup, vice-president; S. W. Latcher, secretary and treasurer, and Thomas F. Nutt, manager. They manufacture meltons, operating two sets and 60 looms, the company doing its own dyeing. The goods are sold direct.

Pennsylvania, Falmouth. G. W. Walton is reported as endeavoring to secure a knitting mill at that place.

Pennsylvania, Grove City. It is reported that a project is underway for organizing a company with capital stock of $50,000 to establish a silk mill here. J. P. Shorrock, until recently with the West Pittsburgh mills, is mentioned as interested.

Pennsylvania, Philadelphia. The No. 2 Mill of the J. Sullivan & Sons Mfg. Co., 2224 N. 9th St., which has been shut down for fourteen weeks, is now in full operation on silk and cotton narrow textiles. Julius R. Bux is the superintendent and buyer for this mill, which is equipped with 178 looms. The main factory is at 9th and Montgomery Avenue.

Pennsylvania, Philadelphia. Mr. John Gallashan, 25th and Callowhill Streets, states that he is about to start up his 60 looms in the manufacture of ladies' dress goods and wool and worsteds for men's wear, and is now getting out his samples. The goods will be sold through S. M. Scott & Co., New York. Mr. Gallashan also states that he intends doing a general commission weaving business. He does his own superintending and buying.

Pennsylvania, Philadelphia. The Philadelphia Carpet Company has been granted a charter by the state. The company has a capital of $100,000.

*Rhode Island, Woonsocket. Charles H. Sawyer is president of the Rhode Island Dyeing & Finishing Company, recently incorporated under Maine laws, to succeed company of same name formed under New Jersey laws. Norris S. Wilson, is treasurer, and Geo. Shutt, general manager.

Rhode Island, Woonsocket. The Rhode Island Dyeing and Finishing Works Company has been incorporated with a capital stock of $500,000 with J. H. Strange of Portland, Me., as president and Oscar L. Lefferts of Newtonville, Mass., treasurer. This is undoubtedly a corporation of the mill, same name which succeeded the George Shutt Dye Works.

Personals.

Cotton.

F. H. Cotton has resigned the superintendency of the Hope Mills Mfg. Co., Hope Mills, N. C., and will make his home with his family at Fayetteville.

J. D. Will, until recently connected with the Raleigh Cotton Mills, has accepted the position of superintendent of the Atherton Cotton Mill, Charlotte, N. C.

S. V. Upchurch, who has been superintending the Atherton Mills, Charoltte, has returned to the Scotland Mill at Laurinburg, N. C.

W. E. Stafford, overseer of weaving at the Gibson Mills, Concord, N. C., has severed his connection with that concern.

Clarence Moody has been appointed overseer of carding and spinning at the Rushton Cotton Mills of Griffin, Ga., to succeed J. W. Walker, resigned.

Enoch B. Cheney, who for some time has been second hand of the carding room of the Aldrich Mfg. Co. in Moosup, has accepted a position as overseer of the carding room for the Danielson Cotton Company, Danielson, Conn. Upon his retiring from the Aldrich Mill he was presented with a Masonic gold charm and a pair of cuff buttons by his employees.

W. R. Tattersall, formerly of Itasca, Tex., is the new superintendent of the Franklin Cotton Mill, Greer Depot, S. C.

E. A. French, formerly of West Huntsville, Ala., is the new superintendent of the Shuford Cotton Mills, Brookford, N. C.

J. R. Killian, superintendent of the Olympia Cotton Mills, Columbia, S. C., has sent in his resignation, to take effect at an early date. He has recently acquired an interest in the reorganized Blacksburg, S. C., Cotton Mill Co., of which he will have general charge as managing superintendent when it is started up.

Andrew Johnson, who for the past twenty-three years has been employed in the Willimantic Thread Mills, Willimantic, Conn., has resigned as one of the overseers of the twisting departments of No. 2 mill.

J. A. Gibson has taken the position of overseer of weaving of the Gibson Mfg. Co., Concord, N. C. He was formerly overseer of weaving of the Delgado Mills, Burlington, N. C.

William Smith has resigned as overseer of carding in the Whitman Mills, New Bedford, Mass., to accept the position of principal of the cotton, picking, carding and spinning departments of the New Bedford Textile School. As Mr. Smith was leaving the mill on Monday noon about seventy of the employees of the carding department gathered around him and presented him a handsome diamond ring.

Charles A. Dexter, who has been filling the position of superintendent temporarily since the retirement of John Ramsbottom of the Samoset Mills, Valley Falls, R. I.; at a recent meeting of the directors was appointed superintendent.

C. Kingsley, overseer of spinning, spooling, warping and drawing-in at the Richard Borden Mfg. Co., Fall River, Mass., has resigned and gone to Montreal, Can., where he has accepted a position with the Merchants' Mfg. Co.

John W. Ramsbottom, for two years superintendent of the Samoset Mills, Valley Falls, R. I., is now superintendent of the Brighton Mills, Passaic, N. J.

William Cochran of Northampton, Mass., has gone to Michigan to give instructions concerning the operations of looms in a narrow fabric mill. He will be away about three months.

Joel Smith, superintendent of the King Mfg. Co., Augusta, Ga., one of the largest cotton manufacturing plants of the South, has resigned, and will be succeeded by C. M. Herrington, for years fore-

man of the weaving room. Charles Wilkerson advances to the position of boss weaver.

Woolen.

James Broughan has resigned as overseer of spooling and dressing for the Peacedale Mfg. Co., Peacedale, R. I.

Henry Hamer is the new overseer of spinning at the Bigelow Carpet Co., Lowell, Mass.

Walter Caswell has entered the employ of the Assawaga Woolen Co., Dayville, Conn.

George Borland, the former overseer in the Moquet department of the carpet works at Thompsonville, Conn., and who has recently been overseer in a carpet mill in Amsterdam, N. Y., has returned to Thompsonville and accepted a position in the new tapestry mill of the Hartford Carpet Co.

Andrew Flynn, who has been boss carder at the Newport Woolen Co.'s mill, at Newport, Me., finished his duties there recently, and his place has been taken by D. M. Menzies, who formerly held the position.

John McGregory, carder and spinner at the Hennessey Woolen Mills, Conway, Mass., has resigned.

George E. Bidwell, formerly overseer of finishing at the Pioneer Woolen Mills, Pittsfield, Me., is now with the Scotia Mills, Woonsocket, R. I.

James Kendry has resigned as manager of the Canada Woolen Mills, Hespeler, Ont., and will be succeeded by S. Moore of Montreal. Mr. Kendry is largely interested in the Auburn Woolen Mills, Peterborough, and his resignation is mainly due to the fact that he desires to pay more attention to the Auburn Mills.

George F. Maguire of Wales, Mass., has accepted a position as boss carder at the Hennessy Woolen Mills, Conway, Mass.

C. A. Kennedy is the new dyer at the Daniels Worsted Mills, Worcester, Mass. He was formerly of Newburgh, N. Y.

E. E. Jones has resigned as overseer of dressing at the Taconic Mills, Pittsfield, Mass.

Thomas Hanley, overseer of weaving at the Chapel Mills Mfg. Co., Cherry Valley, Mass., has resigned.

Walter Brogden has succeeded Joseph Wood as superintendent of the worsted department of the Tingue Mfg. Co., Seymour, Conn.

Frank A. Henry has returned to his former position as overseer of weaving in the National & Providence Worsted Mills, Olneyville, R. I.

John Henzie has resigned as overseer of weaving at the Madison Woolen Company's mill, Madison, Me. He is now superintendent at the Linn Woolen Company, Hartland, Me.

George E. Bidwell, formerly boss finisher for the Pioneer Mills at Pittsfield, Me., has accepted a similar position with the Scotia Worsted Mills at Woonsocket, R. I.

Oscar Pepine, formerly overseer of the winding and dressing department of Shirreffs Worsted Co., North Chelmsford, Mass., has been succeeded by Jerry Toohey from the Scotia Worsted Co., Woonsocket, R. I.

Ernest A. Sutcliffe has accepted a position as boss dyer in William Tinkham's Mill at Harrisville, R. I.

Thomas R. Webster has resigned as overseer of spinning at the Greenville (R. I.), Woolen Company.

John E. Denniston is the new overseer of spooling, dressing and twisting at the Taconic Mill, Pittsfield, Mass. He was formerly with the Assabet Mills, Maynard, Mass.

P. J. Harney has resigned as overseer of spooling, twisting and winding for the Seneca Woolen Mill, Seneca Falls, N. Y.

Albert A. Adams has resigned as overseer of weaving in No. 2 mill of the Dunn Worsted Mills, Woonsocket, R. I. Andrew Archer has succeeded him.

James Williams, overseer of weaving at the Dustin Island Woolen Mills, Penacock, N. H., has resigned.

John Denniston, overseer of the spooling department of the Assabet Mills, Maynard, Mass., has resigned, to accept a similar position in Pittsfield.

James Emmett is the new overseer of weaving at the Hudson Blanket Mill, Hudson, Mass. He was formerly at Maynard.

Deaths.

J. S. Price, who was one of the best known cotton seed oil mill men in the United States, died at Edgefield, S. C., February 13th. He was identified with the Edgefield Manufacturing Company, operating a cotton mill, cotton seed oil mill and refinery. A widow and three children survive him.

James Van Valkenburg, a veteran woolen goods manufacturer, died at his home in Binghamton, N. Y., last month. He was in his eighty-fifth year. He established a woolen mill at Oneonta in 1842, and remained in that line of work until 1850. Then he became a manufacturer of grain cleaning machinery.

Gustave Adolph Arnold died at his home, Utica, N. Y., February 23d. Death resulted from heart failure. The deceased was born in Germany in 1861. He came to this country twelve years ago, locating in Brooklyn. Later he went to Utica. He was superintendent of the Elboeuf Knitting Company, which position he gave up on account of ill health. Last July he opened a small factory of his own under the name of the Adirondack Knitting Company.

The suicide at Cohasset of A. E. Harding of the Boston wool house of Harding & Caverly came as a great surprise to his family, friends and business associates, who are at a loss to explain the shooting on any other grounds than that of ill health and despondency. His wife, a married daughter and three sons survive him.

Joseph Seyer, silk dyer of Paterson, N. J., died at his home February 23rd. He was born in Paris, France, in 1859.

Thomas Bromley, president of the Bromley Bros.' Carpet Company, Philadelphia, Pa., died at his home in Olney on Feb. 13. Mr. Bromley was born in Yorkshire, Eng., in 1835. From 1860, when he entered into partnership with his father, John Bromley, until his death, Mr. Bromley was one of the foremost manufacturers of carpets and rugs in the country.

Stephen Colvin, mechanic, inventor and manufacturer of the power loom for weaving cotton cloth which bears his name, died at Riverpoint, R. I., recently. Mr. Colvin was born at Pippin Orchard, in the town of Cranston, R. I., Feb. 24, 1821. When a young man he entered a machine shop at Anthony and learned the machinists' trade. Later he was employed with the late Lodowick Brayton & Co., iron founders, and with Asa Sisson, builder of the once well-known Sisson loom, in the old machine shop at Anthony. It was while working there that he conceived the ideas which he developed into a number of inventions for the improvement of the power loom for weaving of cotton cloths. The Colvin loom was built for a time at Anthony, and when Mr. Colvin associated himself with Robert and William Brayton and Horatio N. Remington, and the Colvin Machine Shop at Riverpoint, R. I., was built and the business of loom manufacturing carried on until about two years ago, when, soon after the death of Mr. Remington, the junior member of the firm, it was dissolved, and Mr. Colvin retired from active business.

Jonathan Wolfenden, head of the firm of Wolfenden, Shore & Co., owners of the Cardington Mills, Cardington, Pa., died recently.

Ira Tompkins, one of the well-known business men of Troy, N. Y., died February 23, after an illness of several months. Mr. Tompkins, with his brother, Albert, conducted the Tompkins Bros.' machine shop on the East Side, one of the old and well-established business institutions of the city. The business was founded by the father of the two brothers about forty years ago. He invented the upright rib knitting machine, and many devices in connection with knitting machines. About thirty years ago the two brothers succeeded their father and continued the enterprise until a short time ago, when the firm was incorporated as the Tompkins Bros. Co., the younger members of the family being admitted. The deceased was well known throughout the knitting industry. He was possessed of a quiet geniality that attracted, and he was ever ready in an unostentatious way to extend aid to those worthy of it. His integrity in business was never questioned.

Charles Frederick Allen, treasurer of the woolen mill corporation of Robert Bleakie & Co., Hyde Park, Mass., was killed in the engine room of the mill on the morning of February 20th. The body was mangled, and it is thought that he was caught in the fly wheel of the engine. The announcement of his death was a great shock to the townspeople, among whom he was widely known and highly esteemed. He is survived by his wife and one son, a student at Harvard College. Mr. Allen was a man of high character and well known both in Boston and Hyde Park. He was born in Boston 54 years ago. He had been employed at the mill 30 years, and became a part owner seven years ago, when it was formed into a corporation. He was also an owner of considerable real estate in Hyde Park and was interested with Robert Bleakie and the late John S. Bleakie in various enterprises.

John White, for a number of years boss printer of the Manchester Print Works, Manchester, N. H., severed his connection with the establishment recently.

James Webb, one of the most prominent business men of Hillsboro, N. C., died recently. He was about fifty-eight years old. He was, with where and had a large flouring establishment here. Allen J. Ruffin, a joint proprietor of the Eno Cotton Mill. He was interested in cotton mills else-

Frank Cheney, Sr., died at his home in South Manchester, Conn., February 4, of pneumonia, after several days' illness. He was the last member of the original firm of Cheney Brothers, silk manufacturers, and he had been prominently identified with the industrial interests of South Manchester for many years.

Patrick H. Cantwell, superintendent of the E. Frank Lewis scouring works, Lawrence, Mass., died suddenly in the mill February 15. He was about 50 years old and leaves a widow and several children.

O. S. Brown, agent of the Salmon Falls (N. H.) Mfg. Co., died at his home in that town recently, from a stroke of paralysis. He was 59 years of age, and born in Danielsonville, Conn.

Miscellaneous.

J. D. Gilbert has severed his connection with the Johnson Dunbar Co., and taken a position in the finishing department of the Arnold Print Works, North Adams, Mass.

Thomas McLuggage has been appointed assistant to Manager Charles N. Robertson of the Lonsdale Bleach & Dye Works, Lonsdale, R. I. Mr. McLuggage has been employed in the bleachery for the past 15 years, having operated a calender for a number of years, and when Mr. Robertson was appointed manager to succeed John Johnston, was promoted to be foreman of the department in which he had been employed.

Henry W. Nichols, of New Bedford, has been selected by the Board of Directors of the New Bedford Textile School to succeed Mr. Brooks as principal. This is an excellent choice, and is especially interesting because it emphasizes the fact that our textile schools have now been long enough established to have turned out men fitted by training and experience to become in their turn teachers of others. Mr. Nichols is a graduate of the New Bedford Textile School, having taken the course there after a practical mill experience of a number of years. After graduating he was selected by Mr. Brooks as assistant in the correspondence school and has been first assistant in that institution up to the time of his resignation to accept his new position.

New Publications.

The Metric Lighting Calculator for the Textile Industry (Das metrische Schnellrechnen fuer die Textil-Industrie); by H. Sameli, Friedland, Germany. Price, 75 cents.

The title of this excellent little hand book leads one to believe that at last some author has come forward to demonstrate the advantages claimed for the metric system in textile calculations. A very brief examination is, however, sufficient to dispel this idea, although the merits of the work as a practical hand book are unquestionable. The method adopted by the author to facilitate calculations consists in the use of constant numbers which are the ratios between the English or other non-metric units in use in continental mills and the metric standards. In the first chapter, which deals with silk, the author accepts the 500 meter-demi-decigram system as the "international" silk standard, although it has never been used in practice and was formally abandoned by the Paris Metric Congress in 1900 after having been, as it still is, the legal French system for more than thirty years. There is something pathetic in the sight of a Friedland calculator filling page after page with the complicated formulas based on ratios between the denier which is in use and the metric standard which people cannot be forced to use. He has evidently not heard that the Paris Metric Congress changed the 500 meters to 450 meters, and that a committee of that Congress has since adopted the kilogram-kilometer as the metric standard for silk, while the real silk standard continues to be the denier-aune.

The second chapter deals with cotton and here the constant numbers express the ratio between the English standard of German mills and the metric units. The next four chapters treat of linen, hemp, jute and wool, and are taken up with explanations of how to convert the English standards of the mill into metric equivalents. A summary of the various constants is found in the seventh or concluding chapter of the book. The reader will search the book in vain for direct methods of textile calculation. It is involved from beginning to end in a tangle of incommensurable units of weight and measure. Nevertheless it is unquestionably a hand-book of great value to the Continental manufacturers, who are compelled to use these diverse standards.

Currency Conversion Tables (Munzen-Umrechnungstabellen); by Gustav Voigt; Merseburg, Germany, price 50 cents.

A pamphlet of forty pages containing a large number of tables showing the comparative values of currency by the different systems in use throughout the world. Reduction tables for weights and measures are also added. The text is in German, French and English.

Engineer's Handbook (Manuel de L'Ouvrier et du Constructeur) by L. Sourdille; E. Bernard & Cie., Paris, France, price 75 cents.

This is a very complete and useful compilation of useful tables and information relating to mechanics and engineering. It also includes much general information whose scope is too extended to be given even an abstract here. The text is in French.

The Mechanics of Weaving (Les Mecaniques d'Armures); by Paul Lamoitier; Charles Beranger, Paris, France.

This is a reprint of the valuable series of articles which were originally published in L'Industrie Textile. They are now collected in book form and treat of the different head motions for looms, including the Hattersley, Hodgson, Schelling and Staubli, Nuyts, Hahlo, Knowles, Crompton, etc. The description of these apparatus is preceded by a brief statement of the process of weaving. The work, which is in French, is freely illustrated and is written with the usual care and thoroughness of this author.

Ca' Canny; by W. G. H. von Reiswitz; Otto Elsner, Berlin. Price 75 cents.

In the struggle of the English labor unions to secure higher wages and shorter hours, the workers failing to secure the wages demanded, have adopted the plan of limiting the amount of work done in a day to correspond by their standard of value with the wages paid. The English working population have become thoroughly imbued with this idea, which they have welcomed as a means of circumventing the greed of the employer and of obtaining for the employees as a body what they cannot obtain for the individual, namely, a larger share of the wealth produced by labor. The watchword of this idea is Ca' Canny, a Scotch expression meaning to go slow. It is passed from one employee to another and at its sound the possibly too energetic worker slackens his exertions to correspond with the ideas of his fellows.

The decline in many branches of English industry has been widely ascribed to this policy of "ca' canny," and the present work has been written to call the attention of the German public to the fact that the evil, if so it may be called, is by no means confined to England, but threatens Germany as well. The different trades are considered separately and the problem presented by this weapon of the worker is considered from the standpoint of the employer. The work is in German.

Railroad Map of Middle Europe; W. Dums, Wesel, Germany; price 25 cents.

A map 22 by 37 in folder form showing the railroads of middle Europe.

Office and Commercial Travelers' Map of Middle Europe; W. Dums, Wesel, Germany; price 25 cents.

A map 22 by 37 in folder form showing the railroads of Europe and accompanied by an index of the places shown on the map.

Our Industrial Conditions; by Heinrich Baecker; Siemenroth & Troschel, Berlin, Germany.

A pamphlet giving the author's views of the industrial conditions of Germany as affected by competition of other countries, particularly the United States. The text is in German.

Germany at the Parting of the Ways; Heinrich Baecker; Gottl. Schmidt, Remscheid, Germany.

This pamphlet contains an essay upon the prospects of political and industrial Germany whose rapid development since the war of 1871 has placed it among the leading nations of the world. The text is in German.

Business Literature.

The Jeffrey Mfg. Co., Columbus, Ohio.

A booklet describing the Jeffrey grab bucket and trolley which will be of great interest to manufacturers generally.

Buffalo Forge System of Heating and Ventilating; Buffalo Forge Co., Buffalo, N. Y.

A booklet which illustrates and describes the various systems of heating and ventilating installed by the Buffalo Forge Company.

Buffalo Forge Company Engines; Buffalo Forge Co., Buffalo, N. Y.

A booklet illustrating and describing the different types of engines built by the Buffalo Forge Company.

Jacquards; Crompton & Knowles Loom Works, Worcester, Mass.

A very attractive folder calling the attention of the trade to the facilities of the Crompton and Knowles Loom Works' Providence Department for supplying manufacturers with jacquard looms.

Northrop Looms Sold to Jan. 1904; Draper Co., Hopedale, Mass.

A list giving the name of each mill in which Northrop looms have been installed, also the number of looms. The total number of such looms is 116,475.

Bradford-Durfee Textile School, Fall River, Mass.

This is the catalogue of the new textile school established at Fall River and which begins its career with every promise of success. The catalogue contains a list of the officers, directors and members of the faculty. It gives a copy of the Act under which the school was incorporated and a description of the building and its equipment which consists of the latest and most improved machinery for the production of cotton goods.

Three courses of study are provided for the day classes: General cotton manufacturing designing and weaving; chemistry and dyeing. There are twelve courses for the evening classes as follows: Picker and card room; ring spinning and twisting; mule spinning; warp preparation; plain weaving and fixing; box and dobby weaving, jacquard weaving; designing; general chemistry; qualitative and quantitative analysis; dyeing; advanced dyeing.

The catalogue also gives a list of the various donations made to the school.

Plenty of Work in His Shops.

L. T. Houghton, of Worcester, Mass., is very busy with large orders from the leading mills. He has recently changed over all the thread boards in Fall River Iron Works Mill No. 1 to his steel boards, and that company has ordered steel thread boards and metal rails for all its spindles. Trial frames have been placed in a number of other Fall River and Lowell mills. The Pacific mills of Lawrence have recently equipped twenty twisting frames with Houghton's boards.

The overseer of a large mill where these thread boards are in use told the superintendent of another mill that the change improved his spinning 20 per cent. The exhibt of cotton spinning machinery at the World's Fair, St. Louis, will have the frames equipped with the Houghton steel boards.

Extension of an Important Industry.

The Allis-Chalmers Co. has recently widened its scope of manufacture, and engaged in most important industries. They have concluded final arrangements for all the new industries they are to engage in, which are as follows:

A. Steam Turbines.
B. Hydraulic Machinery.
C. Gas Engines.
D. Electrical Machinery.

As regards steam turbines, they have become associated with and form part of the Steam Turbine Advisory Syndicate of England, which is composed of

Yarrow Shipbuilding Co. of England.
Tweedie (Vulcan) Shipbuilding Co. of England.
Willans & Robinson, Engineers and well-known engine builders of England.
Mr. Fullager, formerly chief engineer Parsons Steam Turbine Co. of England, now consulting engineer for Steam Turbine Advisory Syndicate.
Allis-Chalmers Company.

The turbine, built by the Allis-Chalmers Co., is of the horizontal type, which is the type Parsons of England, and Brown Boverie of Switzerland manufacture. The Allis-Chalmers Co. are convinced after an investigation by their engineering staff in Europe and elsewhere extending over a period of two years, that they have a steam turbine that in efficiency and economy is equal to the best make of Parsons or Curtis, which are the two types most known. They are now prepared to enter into the building of steam turbines of the following sizes: 500, 750, 1,000, 1,500 and 5,000 K. W., and can if required build up to units of 10,000 K. W. The largest size that has ever been built of any type of turbine is 5,000 K. W. Their license from the Advisory Turbine Syndicate concedes all of the United States, Canada and Mexico, with equal rights and privileges in South America, and rights to do business elsewhere in the Western Hemisphere.

The Allis-Chalmers Co. have concluded arrangements with Escher-Wyss & Co. of Zurich, Switzerland, whereby they become the sole licensees for the Western Hemisphere of the famous hydraulic machinery, built by the latter, several types of which have been installed at the Niagara Falls plant of the Cataract Construction Co., aggregating 85,000 H. P. Escher-Wyss & Co. have long enjoyed, and still enjoy the reputation of being the best known manufacturers of turbines in the world. Niagara Falls is but one of the plants employing thousands of horse power, installed by Escher-Wyss & Co.

The Allis-Chalmers Co. have bought the American patents, and have become sole licensees for the Western hemisphere of the Nurnberg Machine Co., Nurnberg, Germany, for their gas engines, and are now prepared to make gas engines up to any required horse power. At the present time they are prepared to build gas engines from 250 to

1,500 H. P. These engines are suitable for consumer gas or taking the waste gas from blast furnaces and utilizing same with economy and efficiency. It is in the blast furnace trade that the largest business is expected to result. The engine is not an experiment, as engines of 1,500 H. P. are now in operation in Germany, and it was after two years' investigation by the Allis-Chalmers engineering staff of the various gas engines that the Nurnberg was adopted. It is a prime mover, either for blowing engines in blast furnaces, or for direct connected dynamos in generating electricity, or for any other purpose where power is required.

The Allis-Chalmers Co. have engaged in the manufacture of generators, motors, and electrical apparatus in all branches, both for stationary and railroad work, power house installation for transportation purposes and electric lighting. They have engaged to take charge of this department of the business John F. Kelley, formerly of the Stanley Electric Co., William Stanley of the same company as consulting engineer, and John H. Kelman, formerly superintendent of the Stanley Company as superintendent of this department. In addition they have engaged others of the Stanley Company's staff, and have drawn a further supply from the best electrical establishments in this country and in Europe, so that they are fitted out with a complete engineering staff in every branch of the electrical business.

From the above it will be observed that the Allis-Chalmers Co. have entered the field, not only in the line of prime movers, embracing reciprocating engines, in which field they have always led, but also with steam turbines, gas engines and hydraulics, and with electrical apparatus combined with any one of these prime movers, they are now prepared to estimate upon and accept contracts for complete plants of all description and furnish the best of their respective kind.

Capitola Mill.

There has been considerable talk in the various trade papers regarding the Capitola Mill at Marshall, N. C., importing the poor from New York slums. This statement is somewhat untrue, but Mr. Pottle of 41 Wall St., New York, who is the promoter of the Capitola Mill, says that it was not intended to import New York poor into this particular plant as the Capitola is fortunate to have skilled labor without going out of its own county, which is one of its strongest features.

In a statement recently made by Mr. Pottle he remarked that he has in view the construction of other mills in different parts of the South and is willing to try the experiment at an early date of bringing down the somewhat less fortunate poor people from New York. This cannot be accomplished at once and it will take time in order to carry out fully the ideas, both from the philanthropic and business points of view.

The Capitola Mill has great natural resources in respect to labor and power, and its climatic conditions are excellent. The directors are well known both in the financial and manufacturing world.

The plans for this mill are already completed by the engineers and the success attained by Mr. Pottle in the promoting of this enterprise has induced him to immediately start on another mill in the South. The engineers are now working on the new enterprise.

The stock of the Capitola has been in such demand that there is now a movement on foot to build a No. 2 mill, which will probably be that of colored goods, in the same section.

Now Sole Manufacturers of Johnston Vertical Dryers.

The Johnston Novelty & Mill Specialty Co., of Utica, N. Y., are now the sole owners and manufacturers of the Johnson patent improved vertical dryer for knit goods, having bought out the business of E. M. Antisdel of the same city, and will add this well-known machine to their list of products. This company build quite a line of special machines for the trade, including hydro extractor guards, neck markers, crimpers, neck binders, machine table legs, vertical dryers, gusset cutters, etc. They have recently issued a catalogue showing some of their specialties, which will be mailed on application. They may be addressed at the above address.

The Hegeman Bobbin Cover.

Mr. Frank E. Kolb, of Amsterdam, N. Y., who is well known in the textile trade as a dealer in general mill supplies, has secured the agency for the Hegeman seamless bobbin cover and is already doing quite an extensive business in it. This felt cover has been in use for some time and has given very great satisfaction. Prices and samples will be sent on application—will fit on any size or style of winder bobbin. In addition to his full and complete line of mill supplies, Mr. Kolb is the sole agent for the Adams patented latch knitting needles.

Opening a New York Office.

The G. Drouve Company, of Bridgeport, Conn., manufacturers of the well-known Lovell window and shutter operating device, and manufacturers and erecters of cornices, skylights, ventilators and sheet metal architectural work of every description, have opened a branch office in New York City at 22 East 21st street. This will greatly facilitate the handling of orders and be a great convenience to the trade in general. Catalogues illustrating their goods will be kept on file and can be had from the above address on application.

C. E. Miller, of Philadelphia, Pa., announces to the knitting trade that he has removed from 10 North Second street to new and enlarged quarters at 234 North Third street, where he has been located since the first of the year. Mr. Miller is known throughout the industry for the superior quality of the canvas hosiery bags which he manufacturers and invites manufacturers to give him a call at his new address before placing orders for this class of goods.

The China Manufacturing Company, Suncook, N. H., have adopted the American Moistening Company's system of humidifiers.

A Miller Press Goes to California.

The Miller Press & Machine Company of Woonsocket, R. I., has just shipped one of its latest improved flexible steel bed cloth presses to the Alfred Dolge Mfg. Co. at Los Angeles, Cal. It reports business as very good at the present time.

Gas Engine Driven Fire Pumps.

The desirability of providing separate mains for domestic water supply and for fire service has long been evident to those interested in fire insurance matters. The existence of two systems of mains not only greatly diminishes the possibility of a failure of the water supply, but very often makes it possible to carry a pressure sufficient for fire protection without the need of fire engines. This is of special importance in crowded districts where fire engines are frequently subject to delay and often prove inadequate in fighting fire in modern high office buildings.

While it would be possible to carry a high pressure in the regular service mains, it is entirely impracticable, not only because of the extra expense of pumping all the water at a high pressure, but also the increased leakage and cost of fittings, loss of pressure, etc. Where a high pressure is maintained in separate fire mains, the individual fire protection systems of buildings may be so connected that water is always available on any floor of the tallest building.

Many considerations favor locating the fire pumping station directly in the heart of the district to be protected. The character of the motive power then becomes the next consideration. If steam is used, it will be necessary to keep steam up in the boilers continuously, although the plant may be called into action only once or twice during a year. Electricity has also been proposed, and it might be advisable where connection could be had with a number of independent electric supply circuits, thus minimizing the chances of a shut-down. In one of the largest plants of this character to be installed, gas engines have been chosen, the fuel supply being taken from the city illuminating gas mains.

The pumping station will contain ten 11 1/2 by 12 inch, vertical, direct-acting Deane triplex pumps, each capable of delivering 1,200 gallons per minute at 40 revolutions, against a pressure of 300 lbs. per sq. inch. There are also two 6 1/4 by 12 inch pumps of the same type of 350 gallons per minute. These pumps are to work together or singly, as may be desired, and all will discharge into a common 20-inch main. The water supply for the pumps will be taken directly from the Delaware river through a 36-inch suction main. Only seven of the larger pumps are being installed at present. Each of the large pumps will be driven by a 280 H. P. Westinghouse, three-cylinder, single-acting gas engine, and the small pumps by engines of the same type of 125 H. P. each. The smaller engines will be direct connected to the smaller pumps through friction clutches and will also drive electric ignition generators of 7.5 K. W. each and the air compressors supplying air at 200 lbs. pressure for starting the main engines.

The machines were especially designed for fire service by the Deane Steam Pump Company of Holyoke, Mass., and are brass fitted throughout in order that they may be able to start after long periods of idleness.

The selection of gas engines for motive power is novel, but is believed to be justified in view of the perfection of the modern gas engine as regards reliability and freedom from break-down. The great advantages incident to the use of gas engines are their economy during periods of idleness, as compared with steam plants, and the ability to start up immediately and at full power.

A Special Prescription for Each Case.

The International Boiler Compound Co. of 48 Market St., Chicago, Ill., has been receiving some large orders of late from old customers for whom it has prescribed for boiler troubles. It has just booked a carload order for Portland, Ore., and another for Salt Lake City and Denver, and is sending some large shipments South. It supplies a number of textile mills. Theirs is not a "hit-or-miss" method, where the same prescription covers every case, but a sample of the water used in the boiler is first analyzed, without expense to consumer; it then prescribes the necessary compound, either in solid, liquid or powder form, with very satisfactory results.

The New Process Raw Hide Co., Syracuse, N. Y., manufacturer of raw hide gears and pinions for all classes of machinery, will build a large addition to its plant, on which work will be begun as soon as weather permits. Besides the main building of brick, a power house and foundry will be erected. Its product has met with great favor since it was first put on the market, and although it is only quite recently that it has been brought to the attention of textile manufacturers, they have been quick to see the advantages of these noiseless, durable gears for many purposes in mill work.

The American Water Softener Company, of Philadelphia, have, at the first of the year, opened a branch office in the Outlook building, Columbus, which office is in the immediate charge of Mr. W. H. P. Fisher, General Sales Agent for the company, and Mr. A. C. Tomlinson, General Manager of the Columbus office, who for some time was assistant manager of the Philadelphia office.

Edwin A. Newton, 245 Race St., Philadelphia, who handles a general line of knitting machinery and supplies, is not complaining at the amount of business done. Besides having many orders for second-hand machinery, some very substantial ones for the Hemphill full automatic knitter have been placed with him. He has the Hemphill machine running on exhibition at his store, and it has attracted much favorable attention from manufacturers, to whom every facility is offered for investigating and demonstrating its merits in practical operation. Mr. Newton will be pleased to send his list of machinery for sale to interested parties and to receive from manufacturers details of any knitting machinery or supplies that they have for sale.

The Burt Mfg. Co., Akron, O., have sold The Jones & Laughlin Steel Co. a thirty-inch exhaust head for their plant at Pittsburg, Pa.

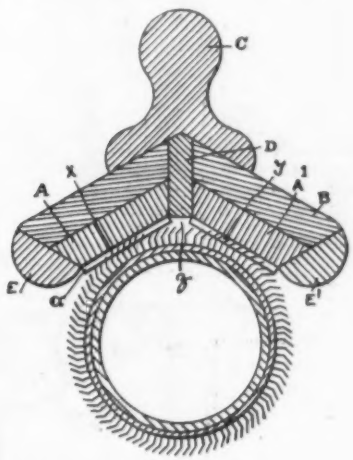
The Bibb Manufacturing Co. of Macon, Ga., has we understand, installed recently some machines from Charles Beck Paper Co. of Philadelphia, that they largely developed themselves, for making cop tubes, both straight and tapering, and are well pleased with the results.

B. B. & R. Knight have ordered a new Green Economizer for their Arctic (R. I.), Mill, to replace one of the same make purchased in 1878. The old machine will be kept in service until the new one arrives.

Recent Textile Patents.

CARD CLOTHING. Strickle for. 751,165 David Gessner, Worcester, Mass.

Heretofore for sharpening and truing up the points of card-clothing such as is used in carding or napping machines, strickles have been employed consisting of an emery-composed surface so constructed as to be capable of only a single area of contact with the cylinder of napping or carding points. In the use of such strickles it has been exceedingly difficult, if not impossible, to maintain the strickle in such positions as to secure regularity in the grinding operation.



The object of this invention is to construct a strickle which will overcome these difficulties.

One part of the invention consists in the novel form of the strickle circumferentially of the cylinder to be treated.

Another feature is its novel form longitudinally of the cylinder to be treated.

The accompanying drawing is made to a scale of about one-half size.

CLOTH FOLDER. 752,995. Horatio Nelson. Philadelphia, Pa., assignor to Samuel S. Wenzell, Philadelphia, Pa.

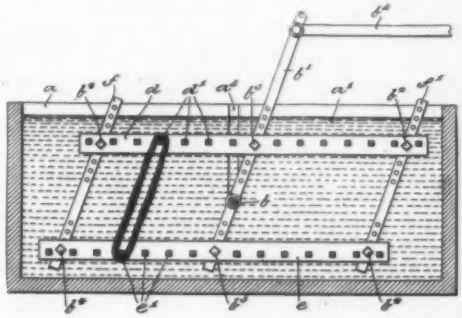
COTTON PICKER. 752,272. Edward B. Vaughan, Selma, Ala.

DECORTICATING MACHINE. 753,055. Alfred D. Estienne, Marseilles, France, assignor to Anglo-French Ramie Machine Co., Paris, France.

DYEING. Apparatus for. 750,601. Friedrich Cleff, Rauenthal, near Barmen, Germany.

DYEING MACHINE FOR YARN. 751,154. Robert Elliott, Olney, Pa., assignor of one-half to William B. Keefer, Philadelphia, Pa.

The principal object of this invention is to provide a machine of simple construction whereby yarns may be quickly and advantageously dyed.



The invention consists of a vat for the reception of the dye liquor, two horizontal frames connected together in a parallel relationship by links and cross-rods on each frame to carry the skeins of yarn, in combination with means for reciprocating the connected frames in the vat, whereby when one frame and its cross-rods travel in one direction the other frame with its cross-rods travel in an opposite direction in the dye liquor.

EMBROIDERED FABRIC. 753,039. Arthur Burgess, Philadelphia, Pa., assignor to Joseph H. Bromley, Philadelphia, Pa.

FIBRE CLEANING MACHINE. 752,258. Manuel Prieto, Mexico, Mexico.

KNOT-CATCHING DEVICE. 750,850. Peter Hardman, Willimantic, Conn.

LOOM. 752,922. James L. Poalk, Philadelphia, Pa.

LOOMS. Filling End Holding Means for Automatic. 750,411. Melvin L. Stone, Lowell, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM LET OFF Mechanism. 747,302. John V. Cunniff, New Bedford, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM LET OFF Motion. 747,179. Carl Hubner, Joseph Muller and Melchior Weidmann, Zurich, Switzerland.

LOOM. Needle. 746,581. Basil Saner, Haledon, N. J.

LOOM SELVAGE Motion. 747,201. John T. Meats, Taunton, Mass., assignor to Mason Machine Works, Taunton, Mass.

LOOM FILLING FEEDER MECHANISM. Automatic. 753,054. John C. Edwards, Brookline, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM FILLING REPLENISHING. 753,012. Edward S. Stimpson, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM JACQUARD APPARATUS. 752,830. Camille M. Edouard and Charles Sorlin, Lyons, France.

LOOM JACQUARD MECHANISM. 751,927. George W. Kuenneth, New York, N. Y.

LOOM LUG STRAP CONNECTION. 751,810. James Thompson, Boston, Mass.

LOOMS. Means for Preventing Warp Breakage In. 753,198. Robert Jamieson, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM PICKER. 751,497. Elias Goldsmith, Norfolk, Va., assignor of two-thirds to J. R. Whitley and J. Pearson Williams.

LOOM PICKER STICK CHECK. 752,110. William E. Sartwell, North Troy, Vt.

LOOM SHED FORMING MECHANISM. 752,316. William Wattie, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM SHEDDING MECHANISM. 752,352. Benjamin F. McGuiness, Grafton, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM SHUTTLE. Automatically Self Threading. 753,214. John W. Sherry, New York Mills, N. Y., assignor to Draper Co., Hopedale, Mass.

LOOM SHUTTLE BOX MOTION. 752,973. Edward Hollingworth, Dobcross, England, assignor to Crompton & Knowles Loom Works, Worcester, Mass.

LOOM SHUTTLE. Self Threading. 751,123. William C. Trombly, Lowell, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM. Swivel. 751,725. J. H. Farrar, Dundee Lake, N. J., assignor to Henry Doherty, Paterson, N. J.

LOOM TEMPLE. 752,606. Charles F. Thompson, Fulton, N. Y.

LOOM WARP STOP MOTION. 750,300. William Oldfield, New Bedford, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM FOR WEAVING BORDERED FABRICS. 751,384. Joseph H. Cunliffe and John Law, Rochdale, Eng.

LOOMS FOR WEAVING CARPETS. Wiring Motion of Edward Hollingworth, Dobcross, England, assignor to Crompton & Knowles Loom Works, Worcester, Mass.

MERCERIZING APPARATUS. 750,694. Tom Pratt, Shipley, England.

PILE FABRIC. Woven. 752,712. Hovcep Sarafian, Yonkers, N. Y.

SPINNING FRAME Ring and Traveler. 743,138. Zachariah E. Booth, New Bedford, Mass.

SPINNING FRAME Ring and Traveler. 743,139. Zachariah E. Booth, New Bedford, Mass.

SPINNING MACHINE. 742,370. Louis F. Weiss, Worcester, Mass.

SPINNING MACHINES. Apparatus for Doffing in Cap. 745,188. Albert H. Illingworth, Bradford, England.

SILK. Making Artificial. 750,502. Edmund Thiele, Barmen, Germany.

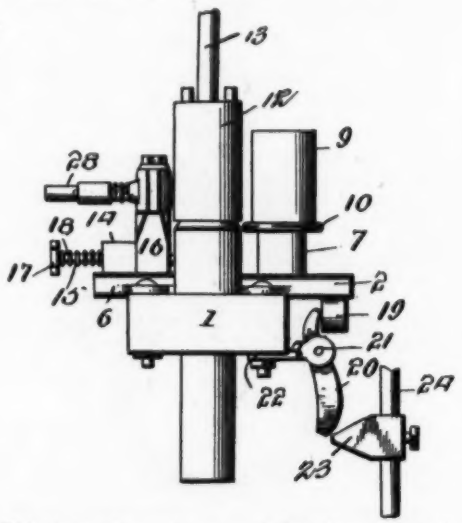
SPINDLE BREAK. 752,199. Daniel G. Brehony, New York Mills, N. Y.

SPINDLE DRIVING BANDS. Mechanism for Guiding. 752,647. John Boyd, Bothwell, Scotland.

SPINNING APPARATUS. Ring. 752,238. Alfred Lovejoy, Lowell, Mass., assignor to Draper Co., Hopedale, Mass.

SPINNING MACHINE. 752,829. Leon Dugauquier, Houdeng-Goegnies, Belgium.

SPINNING MACHINES. Belt Shifter For. 751,894. Manton T. Bentley, York, Pa., assignor of one-half to York Silk Manufacturing Co., York, Pa.



This invention relates to belt-shifters for spinning machines, the object being to provide a simple, durable, positive, and reliable device for automatically shifting the belt out of operative contact with the whirls of the spindles and at the same time applying a brake, the spindles being thus brought to a standstill whenever a thread breaks or a spool runs empty.

SPINNING MACHINE ROLL CLEANING Device. 752,989. Victor Maheu, Willimantic, Conn.

SPINNING AND TWISTING APPARATUS. 752,760. Robert L. Cumnock, Anderson, S. C.

WARPING MACHINE. 752,393. Walter J. Garlick, Paterson, N. J., assignor to Bertha Garlick, Paterson, N. J.

YARN CONTROLLER. 752,813. Simon W. Wardwell, Providence, R. I.

YARN OR THREAD LUBRICATOR. 752,458. Charles J. Lehman, New York, N. Y.

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Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

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American Moistening Co.

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Stearns & Castor.
Suck, Adolph.

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Warren Bros. Co.

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Harwood, Geo. S. & Son.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Schofield, Wm. Co.
Smith, Jas., Woolen Machinery Co.
Woonsocket Machine & Press Co.

Automatic Shuttle and Loom Attachments.
Asala Co.

Balling Machine.
North Chelmsford Machine Co.
Torrance Mfg. Co.

Bandings.
——See under Yarns.

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Lane, W. T. & Bro.
Morris & Co.

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Dodge Mfg. Co.
Jeffrey Manufacturing Co.
Main Belting Co.
Shultz Belting Co.
Smith, Jas., Woolen Mach. Co.
——See also Mill Supplies.

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Textile Finishing Machinery Co.

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Hartford Blower Co.
Mass. Fan Co.
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Sturtevant, B. F., Co.
Schnitzler, Chas. H.

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Kolb, Frank E.

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Leigh, Evan A.
Sweet & Doyle.
Tebbets, E. L. & Co.

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McLeod & Henry.

Boiler Setting.
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Pearson, J. T.

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——See Paper Boxes.

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New England Butt Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

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——See under Perforated Metal.

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Mason Brush Works.

Brushers.
——See Napping Machines.

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Textile Finishing Machinery Co.

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Smith, Jas., Woolen Machinery Co.
Speed Changing Pulley Co.

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Stoddard, Haserick, Richards & Co.
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Bosson & Lane.
Loos & Dilworth.

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Dobbies.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.

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American Drying Machinery Co.
American Yarn Dyeing Machine Co.
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——See Ventilating Apparatus.

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Norwood Engineering Co.
Phila. Water Purification Co., The.
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——See Dyeing, Drying, Bleaching and Finishing.

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Leigh, Evan A.
Textile Machinery Co.

Forges.
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Friction Cones.
Evans, G. Frank.

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Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
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Jones, Lewis.

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New Process Raw Hide Co.

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Whiton, The D. E., Co.

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Heddles.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.
Watson, L. S., Mfg. Co.

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Boston Belting Co.

Hosiery Boards.
Pearson, J. T.

Hosiery Labels.
Saranac Electrical Mfg. Co.

Hosiery (Winders).
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American Air Moistening Co.

Hydro Extractors.
American Tool & Machine Co.
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Empire Laundry Machinery Co.
Craw, J. W., Laundry Machinery Co.

Jacquards.
Halton's, Thomas, Sons.

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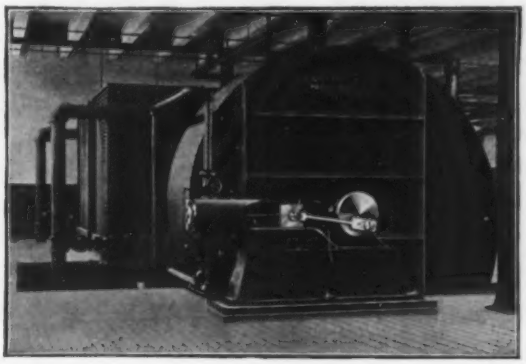

Fans, Blowers, Engines, Motors, Generating Sets, Exhaust Heads, Mechanical Draft Apparatus, Forges, Heating, Ventilating and Drying Apparatus, Industrial Equipments

B. F. STURTEVANT CO.

BOSTON, MASSACHUSETTS

New York Philadelphia Chicago London

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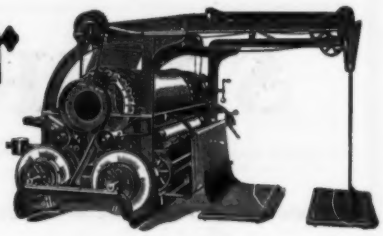
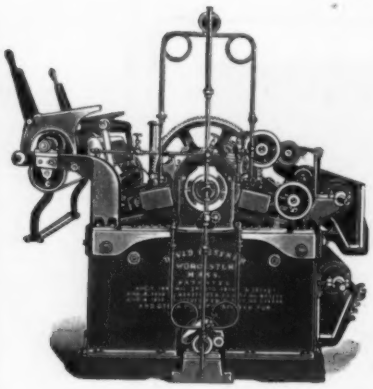
David Gessner

Worcester, Mass.





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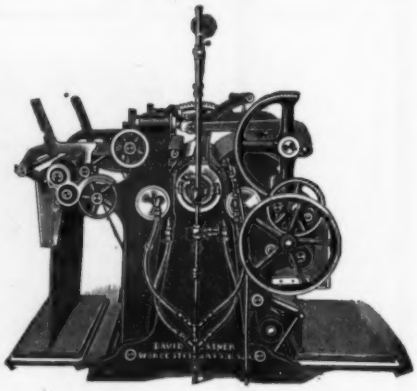
Napping Machines and Presses a Specialty



Knit Goods, Edgings, Trimmings, Etc.
Cathcart, John & Co.
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Charles, W. B.
Cheney Bros.
Friedberger Mfg. Co.
Hepner & Horwitz.
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Craw, J. W., Laundry Machinery Co.
Merrow Machine Co., The.
Nye & Tredick Co.
Scott & Williams.
Willcox & Gibbs Sewing Machine Co.

Knitting Machine Cylinders.
Paxton & O'Neill.
Ruth Automatic Knitting Machine Co.
Stafford & Holt.
Stanton & Lewis.

Knitting Machinery.
American Knitting Machine Co.
Branson Machine Co.
Brinton, H. & Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co.
Irmscher & Co.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Kennedy, Thos. (Cutters, etc.).
Keystone Knitting Machine Mfg. Co.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Lindley, Geo. W.
Mayo Knitting Machine & Needle Co.
McMichael, A.
McMichael & Wildman Mfg. Co.
Mueller, Arthur.
Muller, Julius.
National Automatic Knitter Co.
Newton, E. A.
Nye & Tredick Co.
Paxton & O'Neill.
Pepper Machine Works.
Richter, Wolfgang.
Ruth Automatic Knitting Machine Co.
Schoebel, Walter.
Scott & Williams.
Seyfert & Donner.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walther, Otto.

Knitting Needles and Supplies.
Breedon's, Wm., Son.
Brinton, H. & Co.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Freeman Bros.
Ives, Loyal T.
Keystone Knitting Machine Mfg. Co.
Kolb, Frank E.
Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
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Treat, Orion.
Wardwell Needle Co.

Labeling Machines.
Beck, Chas., Paper Co., Ltd.
Saranac Electrical Mfg. Co.

Laboratory Outfits.
Feldt, Geo. D. & Co.

Looms.
Asaia Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Draper Company.
Howard Fndy. & Mch. Wks. (For Wire).
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Hepworth, John W. & Co.
Leighton Machine Co.

Lubricators.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
Lunkenheimer Co.
Pittsburgh Gage & Supply Co.

Lumpers.
Gerry, George & Son.
Schofield, Wm. Co.

Machinery Dealers.
Jefferson, Ed. & Bro.
Lamb, J. K., Textile Mach. Co.
Pittsburgh Gage & Supply Co.
Schofield, Geo. L.
Taylor, James.

Machinists' Tools.
Whiton, The D. E. Co.
Walder, J.

Mails.
Curtis & Marble Machine Co.

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Elliott & Hall.
Fabric Measuring & Packaging Co.
American Blower Co.

Mechanical Draft.
Boston Blower Co.
Buffalo Forge Co.
Hartford Blower Co.
Massachusetts Fan Co.
Sturtevant, B. F., Co.

Mechanical Engineers.
American Blower Co.
Buffalo Forge Co.
Dean & Main.
Freeman, Walter K.
Hartford Blower Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.
Suck, Adolph.

Mercantile Agency.
Dun, R. G., & Co.

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Blissville Mills.
Cooper Mercerizing Co.
Greenwood & Bault, R.
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Lorrimer, Wm, H., Sons Co.
Pennypack Yarn Finishing Co.

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Niederlahnsteiner Maschinenfabrik.
Smith, Drum & Co.
Textile Finishing Machinery Co.

Mill Architects.
——See Architects and Mill Engineers.

Mill Brushes.
——See Brushes.

Mill Builders and Engineers.
Ferguson, John W.

Mill Sewing Machines.
——See Sewing Machines and Supplies.

Mill Supplies.
American Supply Co.
Bamford & Smith.
Barker, James.
Brigham, Arthur A.
Buckley's, Benj., Son., Gun Mill.
Crosby Steam Gage and Valve Co.
Dixon Lubricating Saddle Co.
Easton-Burnham Co.
Hartford Blower Co.
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Jeffrey Manufacturing Co.
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Kolb, Frank E.
Lane, W. T., & Bro.
Leigh, Evan A.
Main Belting Co.
Morris & Co.
Murphy, E. W., & Co.
Philadelphia Drying Machinery Co.
Pittsburgh Gage & Supply Co.
Putnam & Co.
Riley, C. E., & Co.
Richardson Bros.
Shaw, Victor, Ring Traveler Co.
Smith, Jas., Woolen Machinery Co.
Stephenson Mfg. Co.
Stoddard, Haserick, Richards & Co.
Sweet & Doyle.
Thurston, A. G., & Son.
Tucker, W. W. & C. F.
Ward & Vandegrift.
Walworth Manufacturing Co.
Watson, L. S., Mfg. Co.

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City Forge & Iron Works.
Towsley, John T., Mfg. Co.

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American Napping Machine Co.
Borchers, Richard C., & Co.
Columbia Napping Machine Co.
Curtis & Marble Machine Co.
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Jones, Lewis.
Leigh, Evan A.
Parks & Woolsen Machinery Co.
Woonsocket Napping Machinery Co.

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Malcolm Mills Co.
Ryle, Wm., & Co.

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Force, Wm. A., & Co.

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Lunkenheimer Co.
Pittsburgh Gage & Supply Co.
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Burt Manufacturing Co.
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Borne, Scrymser Co.
Murphy, E. W., & Co.
New York & New Jersey Lubricant Co.
Stephenson Mfg. Co.

Oilless Bearings.
Arguto Oilless Bearing Co.

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Tucker, W. W. & C. F.

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Siggers & Siggers.
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Roessler & Hasslacher Chemical Co.

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——See Ventilating.

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American Drying Machinery Co.
American Pulley Co.
Cohoes Foundry & Machine Co.
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Horsburgh & Scott.
Howard Foundry & Machine Works.
Hunter, Jas., Machine Co.
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Pittsburgh Gage & Supply Co.
Philadelphia Drying Machinery Co.
Reeves Pulley Co.
Saginaw Manufacturing Co.
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Speed Changing Pulley Co.
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Kitson Machine Co.
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North Chelmsford Machine Co.
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Textile Finishing Machinery Co.
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Pressure Regulators.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
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Pulleys.
——See Power Transmitting Machinery.

Pumps.
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Goulds Mfg. Co.
Textile Finishing Machinery Co.

Pump Governors.
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

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Kennicott Water Softener Co.
Norwood Engineering Co.
Philadelphia Water Purification Co.
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Philadelphia Textile Machinery Co.
Schofield, Wm., Co.
Smith, Jas., Woolen Machinery Co.

Ramie Tops and Noils.
Tierney, Frank A.

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Horsburgh & Scott.
New Process Raw Hide Co.

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American Supply Co.
Walder, J.

Reels.
Luther, C. A., & Co.
North Chelmsford Machine Co.

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Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

Regulators (Pressure).
Crosby Steam Gage & Valve Co.
Mason Regulator Co.
Walworth Mfg. Co.

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Feingold, H. & D.

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Cheney Bros.

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National Ring Traveler Co.
Shaw, Victor, Ring Traveler Co.

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Standard Paint Co.

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Haskell-Dawes Machine Co., The.

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Hill, James, Mfg. Co.
Laminar Fibre Co.

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Boston Belting Co.

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Dixon Lubricating Saddle Co.

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Sweet & Doyle.

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Merrow Machine Co.

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Lowell Textile School.
New Bedford Textile School.
Philadelphia Textile School.

Secondhand Machinery.
——See Mchry. Dealers also classified ads.

Screens (Perforated).
——See under Perforated Metal.

——See Commission Merchants.
——See Commission Merchants.

Separators.
Draper Co., The.

Sewing Machines and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch Bros. Co. (Somerville Mchn. Wks.)
Curtis & Marble Machine Co.
Dinsmore Mfg. Co.
Fales, L. F.
Manufacturers' Supplies Co.
Somerville Machine Wks., Birch Bros. Co.
Textile Finishing Machinery Co.
Willcox & Gibbs Sewing Machine Co.

Shafting, Hangers, Etc.
——See Power Transmission Machinery.

Shearing Machinery.
——See Dyeing, Drying, Bleaching and Finishing.

Sheet Metal Work.
Barney Ventilating Fan Works.
Hartford Blower Co.
Lupton's, David, Sons Co.

Shell Rolls.
Thurston, A. G., & Son.

Shoddies.
——See Wool Shoddies.

Shuttles.
——See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch Bros. Co. (Somerville Mchn. Wks.)
Butterworth, H. W., Sons Co.
Leigh, Evan A.
Mason Machine Works.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.

Silk Mill Supplies.
Hall, I. A., & Co.

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Taunton, New Bedford Copper Co.
Textile Finishing Machinery Co.

Singeing Machines.
Arlington Mch. Wks. (Arthur Birch, prop.)
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Curtis & Marble Machine Co.
Knapp, Charles H.
Leigh, Evan A.
Somerville Machine Wks., Birch Bros. Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.

Sizing, Starch and Gums.
Arabol Mfg. Co.
O. K. Soap Co.
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Skylights.
Drouvé, G., Co.
Lord & Burnham Co.
Lupton's, David, Sons Co.

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Leigh, Evan A.
Lowell Machine Shop.
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Buckley, Benjamin, Sons, Gun Mill.
Draper Company.
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Leigh, Evan A.
Riley, C. E., & Co.
Stoddard, Haserick, Richards & Co.
Ward & Vandegrift.
Whitin Machine Works.

Spindle Tubes.
Bamford & Smith.
Riley, C. E., & Co.
Stoddard, Haserick, Richards & Co.

Spinning Frames.
——See Cotton Machinery.

Spinning Rings.
Draper Company.
Whitinsville Spinning Ring Co.

Spinning Tubes.
Buckley, Benjamin, Sons.

Spools.
——See Bobbins, Spools, Shuttles, Etc.

Spoolers.
Easton & Burnham Machine Co.
Lindsay, Hyde & Co.
Payne, George W., & Co.

Stamps for Hosiery.
Wells, Wilfred.

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Allen, Wm., & Sons Co.
Wickes Bros.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co.

Steam Boxes.
Allen, Wm., & Sons Co.

Steam Engines.
Allis-Chalmers Co.
American Blower Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Atlas Engine Works.
Birch Bros. Co. (Somerville Mchn. Wks.)
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Fishkill Landing Machine Co.
Harrisburg Foundry & Machine Co.
Hooven (The), Owens & Rentschler Co.
Sturtevant, B. F., & Co.
Textile Finishing Machinery Co.

Steam Jacket Kettles.
Badger, E. B., & Sons Co.

Steam Pumps.
Goulds Manufacturing Co., The.

Steam Specialties.
Butterworth, H. W., Sons Co.
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Lunkenheimer Co.
Mason Regulator Co.
Parson Mfg. Co.
Pittsburgh Gage & Supply Co.
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Steam Traps.
Albany Steam Trap Co.
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——See Warp Stop Motions.

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Caldwell, W. E., Co.
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Stevens, D. B., & Co.
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Pettes & Randall Co.

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Draper Co.

Tentering Machines.
——See Dyeing, Bleaching Machinery, Etc.

Tenter Clips.
——See Dyeing, Drying, Bleaching and Finishing Machinery.

Testing Machines.
Howard Foundry & Machine Works.

Textile Schools.
——See Schools.

Thread Board for Spinning & Twisting Frames.
Houghton, L. T.

Thread Dressers or Polishers.
Luther, C. A., & Co.

Ticketing Machinery.
——See Labeling Machines.

Tower Clocks.
Howard, E., Clock Co.

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Towsley, John T., Mfg. Co.

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——See Water Wheels.

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Massachusetts Fan Co.
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Philadelphia Textile Machinery Co.
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Sturtevant, B. F., Co.
Wing, L. J., Mfg. Co.

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Draper Co.
Entwistle, T. C., Co.
Philadelphia Textile Machinery Co.

Warp Stop Motions.
Draper Co.

Washers (Cloth).
Arlington Mch. Wks. (Arthur Birch, prop.)
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Birch Bros. Co.
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Hunt, Rodney, Machine Co.
Hunter, Jas., Machine Co.
Kenyon, D. R., & Son.
Philadelphia Drying Machinery Co.
Somerville Machine Wks., Birch Bros. Co.
Textile Finishing Machinery Co.

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Leffel, James, & Co.
Replogle Governor Works.

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Lunkenheimer Co.

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Brigham, Arthur A.
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Foster Machine Co.
Leigh, Evan A.
Lindsay, Hyde & Co.
Payne, George W. & Co.
Universal Winding Co.

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Taylor, James.

Winders (Ball.)
North Chelmsford Machine Co.

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Sweet & Doyle.

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Beck, Chas., Paper Co., Ltd.

Winders. (Hosiery).
Altemus, Jacob K.
Brigham, Arthur A.
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Foster Machine Co.
Leighton Machine Co.
Lever, Oswald.
Payne, G. W., & Co.
Universal Winding Co.

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B. C. ALVORD, Secretary.

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Saginaw Manufacturing Co.
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Ford, J. B., Co.
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Wool Combing Machinery.
Crompton & Knowles Loom Works.
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Riley, C. E., & Co.
Stoddard, Haserick, Richards & Co.
Wool Oils.
Borne, Scrymser Co.
Wool and Waste Dusters.
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Schofield, Wm., Co.
Smith, Jas., Woolen Machinery Co.
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Heyer, Charles H.
Woolen and Worsted Machinery.
Altemus, Jacob K.
American Drying Machinery Co.
American Tool & Machine Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Barker, James.
Birch, Arthur, Arlington Machine Wks.
Birch Bros. Co. (Somerville Mchn. Wks.)
Butterworth, H. W., Sons Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Curtis & Marble Machine Co.
Fales, L. F.
Firth, William, Co.
Gessner, David.
Harwood, Geo. S., & Son.
Hood, R. H.
Howard Foundry & Machine Works.
Hunt, Rodney Machine Co.
Hunter, Jas., Machine Co.
Jefferson, Ed., & Bro.
Kenyon, D. R., & Son.
Leigh, Evan A.
Lever, Oswald.
Lowe, Stephen C.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E., & Co.
Sargent's, C. G., Sons.
Schofield, Geo. L.
Schofield, William, Co.
Smith, Jas., Woolen Machinery Co.
Somerville Machine Wks., Birch Bros. Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Woonsocket Machine & Press Co.
Wool Oiling Apparatus.
Harwood, Geo. S., & Son.
Wool Shoddies.
Becker, C. W.
Riverdale Woolen Co.
Slack, Wm. H. H., & Bro.
Wool Washing, Preparing and Drying Machinery.
American Drying Machinery Co.
Hunter, Jas., Machine Co.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Riley, C. E., & Co.
Sargent's, C. G., Sons.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.
Yarn Printing Machines.
Luther, C. A., & Co.

YARN, THREADS, ETC.

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Ballou Yarn Co.
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Dana Warp Mills.
Dodds, J. S.
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Fawcett, Hughes.
Moeller & Littauer.
Sternberg, Fred, & Co.
Tierney, F. A.
Gassed Yarns.
Ballou Yarn Co.
Cooper Mercerizing Co.
Dodds, J. S.
Eichmann & Sternberg.
Greene & Daniels Mfg. Co.
Moeller & Littauer.
Sternberg, Fred, & Co.
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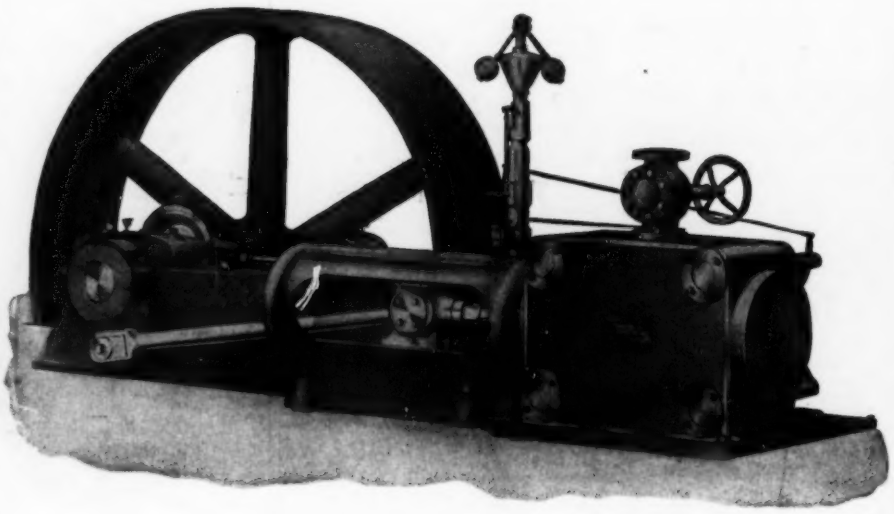

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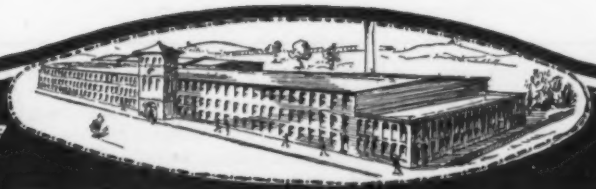

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For Sale. Small Sweater Mill; 3 power, 2 hand machines. Sewing Machines, Winder, etc. Complete; in good condition. Address M. ARNOLD, 147 Dudley Ave., Utica, N. Y.

Wanted. One upright set of drying cylinders, not less than 90" face, five sections or more. Address, "S. F. C.," Textile World Record Boston.

Mercerizing Machine For Sale

Capacity 150 pounds per day skein yarn. In use one year. Can be seen running. Price **$150.00.** Address, MERCERIZING, care of Textile World-Record.

FOR SALE

Underwear Mill equipped to produce 1000 dozen Men's Ribbed Underwear per week. 27 Nye & Tredick & Brinton & Denny Heads. A 60-inch Napper, new. Plant was running full November 1, 1903. Reason for selling, owner cannot give it the attention required.

Address, **F. J. THIEME,**
Care of Wayne Knitting Mills,
Fort Wayne, Indiana.

FOR RENT

WITH POWER, 108 LOOMS English and American, 43 inch to 62 inch reed space, single and six and one boxes, with dobbies, Jacquards, treads, in one fine room 160 x 50, light four sides. Further particulars on application to

COPE & CO., Tonawanda Mills,
Wayne Junction, Station G, Philadelphia.

KNITTING MILL FOR SALE.

A modern knitting mill equipment; machinery all installed in 1902 and 1903 with recent additions; located in western city of *30,000; shipping facilities unsurpassed.*

20 knitting frames; 12 sleevers; 35 sewing machines; m own electric plant; intelligent female help.

Abundant water power. Very cheap water lease and plant lease; now manufacturing 100 dozen per day of Mens', Women's Misses' and Children's ribbed, fleeced underwear.

Established business with the retail trade in the Middle-West, North-West and South-West; strong, established selling force; $25,000.00 orders now booked to work on for Fall delivery.

This plant is in continual operation; a going, growing concern; will retain 1-3 interest; very advantageous yarn contracts will be included in the sale. Good reasons for selling.

Address "S. KNITTING MILL," care of Textile World Record, Boston, Mass.

Factory For Sale.

Near Philadelphia, with or without Machinery and Good Will, or owner would leave part interest as stock At present occupied as Knitting Mill, but has ample room and power for heavier work. Lot 300 by 160 feet. Main building stone and brick. Boilers 160 H. P., Engine 65 H. P. For particulars address "B," care Textile World Record, Boston.

Textile Machinery For Sale.

The undersigned will receive bids up to Monday, March 28th, 1904, for the whole or any part of machinery and fixtures of the Virginia Textile Company, located at Lynchburg, Va.

Any purchaser taking over the whole outfit and desiring to continue the business, will have the privilege of taking over the lease on the building, which has about five years to run. Detailed list of the machinery and further particulars may be had on application. Correspondence invited.

TYREE & WILKINS,
821 Main St., Lynchburg, Va.

A large house, well and favorably known throughout the country, having its own branches in New York, Chicago, St. Louis and San Francisco, and resident salesmen in Boston and Philadelphia, is open for one or two mill accounts. Its facilities for introducing goods to the best markets in the U. S. are exceptional. Correspondence invited from mills desiring such connection or which contemplate changing their sales agents. Address
"B. B. B." P. O. Box 165, New York.

An Ideal Location for Knitting or Silk Mills is at Sharon, Pa.

It is a well-known fact that the great success of the knitting and silk mills in the iron and coal district of Pennsylvania is largely due to the abundance of intelligent female help to be had at reasonable wages. The men work in the mines and iron works, where there is no employment for women. Sharon is a great iron and coal centre. This city is located halfway between New York and Chicago, with direct connection with all the trunk lines in the country. Very favorable freight rates. Very low taxes. Fuel supply either natural gas or coal, at very low rates. Good filtered water supply. For residence has every advantage in the way of schools, churches, libraries, etc. Some of the largest steam, iron, coal and coke industries in the country are here, and as there is no textile establishment to give employment to the great abundance of female help,

The Opportunity is Unusual.

The city is famous for its health, energy, prosperity and industrial advantages, and new industries are cordially welcomed and encouraged.

Address, W. B. HERRIOTT,
Sec'y Board of Trade, SHARON, PA.

FOR SALE.

A Kitson Wool Dryer

Having a capacity of 4000 pounds a day. In good condition. Will be sold cheap for cash. Address

J. ELWOOD LEE CO.,
Conshohocken, Pa.

FOR SALE.

Yorkshire Teasel Gigs and Slats

Write for particulars to

W. W. CRANE FOUNDRY AND MACHINE WORKS,
122-124 Clark St., Auburn, N. Y.

SECOND-HAND APPERLY FEEDS FOR SALE

Replaced by Bates Positive Driven Feed. Apply

E. V. BATES,
Box 539, Lowell, Mass

MEN WANTED.

Same rates as Wants, For Sale, etc. Manufacturers will be furnished, without charge, with the names of suitable men who are entered on our list, and can usually supply their wants in this way.

WANTED, PAPER BOX MANUFACTURER

Acquainted with all details in manufacturing paper boxes. Address "Dixie," Textile World Record, Boston.

WANTED—A man with thorough experience in the construction and erection of Drying Apparatus for Textile Industries. One who is well acquainted with the Philadelphia trade desired. Address "APPARATUS," Care Textile World Record, 425 Walnut St. Phila., Pa.

Wanted.. A competent man to take charge of a large cloth room in a cotton mill. Must be familiar with napped goods, a good manager of help and careful in attending to the details of customers' requirements. Address Cloth, Textile World Record, Boston.

Partner Wanted in Knitting Business. I have a fine little plant perfectly equipped with all necessary machinery for making knit gloves and mittens. Good location. Good help. I am a practical man and want partner with about $10,000 to attend to the business end. Mill now running with good demand for product at a satisfactory profit. Address Partner, Textile World Record, Boston.

Wanted, an Overseer or foreman familiar with the making of Mohair velvets. Address V. M., Textile World Record, stating experience and present occupation.

Partner Wanted. Practical man thoroughly experienced in knitting men's high grade union suits, to join advertiser in starting small plant. One with some capital preferred, but not absolutely necessary. Address, Knitting, Textile World Record, Boston.

Hosiery Machinist Wanted. An experienced machinist, one thoroughly acquainted with building hosiery knitting machines. State experience and reference. Good position for right party. Address Box H, Textile World Record, Boston.

Are You Satisfied with your present position and salary? If not, write us for plan and booklet. We have openings for Managers, Secretaries, Advertising Men, Salesmen, Bookkeepers, etc., paying from $1,000 to $10,000 a year. High grade exclusively. Hapgood (Inc.), Suite 511, 309 Broadway, New York.

Want Men Familiar with Oiling Wool to sell Wool Oils in New England. Old established brands on market twenty years. Correspondence confidential. Address "F. W. B.," care Textile World Record, Boston.

SITUATIONS WANTED.

Position Wanted. What can you offer? Young technical man, M. E. sales, drafting, engineering experience, of good address. Can get business or dig ditches. Address Technical, Textile World Record, 425 Walnut Street, Philadelphia.

Position Wanted. A young man now holding position as designer in cotton mill desires to change location. Thorough experience on fancies, lenos, jacquards and lappets. Address, Designer, Textile World Record, Boston.

Tailors and Furriers Wadding. An A1 all round Wadding man is open for engagement with responsible parties. No other need answer. Address, Wadding, Textile World Record, Boston.

Wanted. Position as superintendent of the manufacture of hosiery, practical in all departments, capable of fixing most all makes of knitters, loopers, ribbers and sewing machines. Also dyer of hosiery. Want position by April 1st. Address Super, Textile World Record, Boston.

Woolen Yarn Dyer. Young Scotchman; excellent color matcher, would like position as head in small or assistant in large place. Address, Matcher, Textile World Record, Boston, Mass.

Wanted. Position as bleacher and finisher of cotton goods, eleven years' experience, eight years foreman, understand mercerizing. Address, Superior, Textile World Record, Boston, Mass.

Knitting Superintendent

A man of wide experience in the manufacture of all classes of underwear and hosiery desires a position as manager or superintendent. **Will be open for a position April 1st.** Is familiar with full fashioned knitting machinery and latch and spring needle underwear machines of various American makes, also understands manufacturing of women's and misses' hosiery, seamless and ribbed, and men's half hose. Will either take charge of manufacturing alone or is competent to fill a position where would have oversight of the disposition of product and buying yarn and supplies. Age 45; married. Habits first-class. References of the best. No capital to invest, but would prefer arrangement on salary and percentage. Address, "O. K.," care Lord & Nagle Co., 299 Devonshire St., Boston.

SITUATIONS WANTED.

COTTON SUPERINTENDENTS.

Wanted, position as superintendent of cotton cloth or yarn mill. American, 42 years old. 27 years' mill experience. Past six years as superintendent. Goods from 3 1/2 to 14 yards per pound. Recommendations from Massachusetts and Vermont mills. 214, Textile World Record.

Superintendent Cotton Mill open to a position. Age 33; American; married. Good experience as overseer of carding in large mills. Combed and carded hosiery yarns, shirtings, sheetings, cheviots, madras. First-class references. 2096, Textile World Record.

Superintendent. Worked on ginghams and cotton warps of all kinds. Lowell, Whitin and Draper machinery. Age 41; American. Good experience. 2095, Textile World Record.

Assistant Superintendent, Chief or Mechanical Engineer. Age 38. Technical graduate. 15 years' practical experience in cotton and flax mill repairs and equipment, well acquainted with cotton, flax, tow and jute machinery, and detail construction of same, also with the installation of power plants and power transmission. Would make a first-class mechanical superintendent. Best of references. Prefer New England. 2068, Textile World Record.

Supt. of Cotton Mill, or overseer of mule or ring spinning is open to a position; 16 years' experience in Northern mills, on yarns, denims, awnings, apron checks, bicycle suitings, shirtings, etc., etc. Familiar with all well-known makes of cotton machinery; 29 years old; American; married. Can give references from large Massachusetts mills. 1527, Textile World Record.

Superintendent. Would like position in South. Not particular about salary to start. Machinist and thoroughly acquainted with all kinds of card room machinery, also spinning frames. Taken superintendent course in textile school and has had 23 years of practical experience in the mill, mostly on fine yarn work. 3044, Textile World Record.

Cotton Mill Superintendent. Age 38; Scotch; married. All counts of American and Egyptian cotton from 10 to 60, twist and weft, warps, beams, and bundles and crape yarns, super quality. Familiar with Platt, Asa Lee, Howard & Bullough, Hetherington and Brooks & Doxey machinery. First-class references. 3042, Textile World Record.

Superintendent, or overseer of carding. Worked on combed and carded yarn from 20 up to 140, twilled sateens, lawns, sheetings and shirtings. English and American machinery. 3036, Textile World Record.

Cotton Mill Superintendent, or assistant. Age 34; married. Worked on cotton machinery on coarse and medium numbers. Textile school education in designing, carding and spinning. 3003, Textile World Record.

Assistant Superintendent or boss weaver of cotton mill. Twenty-five years' experience. Unquestionable references as to character and ability. Thoroughly acquainted with plain, fancy box or lappet looms. Can take place on short notice. 3034, Textile World Record.

Superintendent of Cotton Yarn Mill or duck mill. A young man; American; married. Prefers position in the South. Worked in different departments, spinning, spooling, twisting, warping, reeling and balling and now ready for a superintendent's place. Unquestionable references. 3037, Textile World Record.

WOOLEN SUPERINTENDENTS.

Superintendent of large experience in the manufacture of woolen and worsted fancies and suitings, is open to an engagement as superintendent or designer. Age 45; American; married. Good references. 1932, Textile World Record.

Superintendent or designer. Age 35; American; unmarried. Satinets, unions, fancy cassimeres, kerseys, worsteds. Good experience and references. 3058, Textile World Record.

Superintendent. Worked on cassimeres, unions, satinets, overcoatings, horse goods, bed blankets, linings, etc. Understands stock mixing, picking and figuring. Has had full charge of mill. 3074, Textile World Record.

Superintendent. Has made yarn and shoddies and about everything in woolen line. Good general knowledge of woolen manufacture. Familiar with English, Belgium and American carding, spinning and preparatory machinery. 3088, Textile World Record.

Superintendent or Overseer. 20 years' experience as overseer in both England and Scotland over combing, drawing, spinning, etc. Can work both long and short wools, get up all kinds of mixtures, instruct the shading of batches, etc. Has good references. 43 years of age. 3086, Textile World Record.

Superintendent or Designer, an American, married. 38 years of age, is desirous of obtaining a position. Understands the manufacture of worsteds, cotton worsteds, cassimeres, meltons—steam face, flannels, and horse and bed blankets. Long experience and up-to-date in methods. Moderate wage. 1936, Textile World Record.

Superintendent. American; married. Worked on cassimeres, dress goods, cotton warps, and has had some experience on worsteds. Will go anywhere, but would like a good Western mill. Good experience. 3024, Textile World Record.

Superintendent woolen mill. Age 47; English; married. Wants New England or Middle States. 10 years' experience in first-class N. E. mills. 2028, Textile World Record.

Designer or Designer and Superintendent. Fancy cassimeres of every description, men's wear in general, also fancy cloakings, golf goods, coverts, dress goods, both piece dyed and fancy, kerseys, etc. Aged 42; married; American. 1250, Textile World Record.

Superintendent or designer of small or medium sized mill. All kinds of fancy worsteds, cassimeres, cheviots, overcoatings and dress goods. Age 31; married; Scotch. 3076, Textile World Record.

Asst. Superintendent or Overseer. 20 years' experience as overseer in both England and Scotland over combing, drawing, spinning, etc. Can work both long and short wools, get up all kinds of mixtures, instruct the shading of batches, etc. Has good references. 43 years of age. 3086, Textile World Record.

Superintendent wants position. Worked on cassimeres, cloakings, unions, etc. American; married. 15 years' experience. References. 1674, Textile World Record.

Manager or Superintendent of a woolen mill, who understands designing, is open to an engagement. 34 years old; Scotch, and single. Large experience in Scotch and Canadian mills on tweeds, worsteds, overcoatings, etc. Good references. 1890, Textile World Record.

COTTON CARDERS.

Carder in Cotton Mill. Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married. 3029, Textile World Record.

Overseer of Carding. Large experience on all kinds of work and both English and American systems. Can furnish first-class references. Had charge of carding in some of the best New England mills. 3009, Textile World Record.

Overseer of Carding or cotton ring spinning. Worked on carded and combed Peelers, Egyptian, and Sea Island cottons, making yarns from 8 to 80. 3015, Textile World Record.

Overseer of Card Room. Had good experience in carding, and is an expert in the manufacture of combed yarns from the bale to the finished article. Good references. Wants no less than $18 per week, and will no go South or to Canada. 1745, Textile World Record.

Overseer of Carding. Has held all positions in picker and card rooms. White and colored goods, 8s to 40s. 3070, Textile World Record.

Overseer of Carding Mill. All kinds of fine yarns. Started up two of the largest card rooms in New England. Considered an expert in the manufacture of combed yarns from the bale to the finished article. First-class recommendations. 1745, Textile World Rcord.

Overseer of Cotton Carding. Worked on all classes of cotton, carded and combed, in counts to 135s. Will not go West or South. 3061, Textile World Record.

Overseer of Carding or Ring Spinning. Age 35; American. Sheetings, prin e and yarns, coarse and fine. Worked on most American machinery, but is more familiar with Lowell & Whitin. 1915, Textile World Record.

Overseer of Cotton Carding. Worked on all classes of cotton, carded and combed, in counts to 135s. 3061, Textile World Record.

Boss Carder. Aged 28. Worked on plain goods. Will go South or anywhere. Steady man, and excellent references. Also a frame spinner. 1759, Textile World Record.

WOOLEN CARDERS.

Overseer for Washing, Carding or Combing wool for worsted wants to better himself. Speaks German, French and English. Best of references. 2033, Textile World Record.

Carder, or carder and spinner. Age 49; American. Has worked on all kinds of woolens, and of late on shoddy and cotton mixes. Is familiar with Davis & Furber machines. Excellent reference from past employer. 1944, Textile World Record.

Overseer of Woolen Carding. Worked on all wool, wool and shoddy, wool, shoddy and noils. Wants $4 a day. Familiar with Davis & Furber, Furbush, Lombard and Bollette and Brown Patent. 3071, Textile World Record.

Overseer of Combing, washing, carding. Age 36, English, married. All classes of wool. Good experience and first-class recommendation. 3094, Textile World Record.

Overseer of Woolen Carding. Would accept secondhand position. All wool, cotton and wool, shoddies, mixes, worsteds. Does not wish for position on shoddy, but would consider one. Blankets, suitings, flannels. Understands spinning. 3093. Textile World Record.

COTTON SPINNERS.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yarns ranging from 24's to 160's is open to a position. 37 years old; American. Good references. 2003, Textile World Record.

Overseer Ring Spinning, or asst. superintendent. Sea Island combed from 6s to 30s, American from 6s to 50s; in fact, all grades of cotton, also expert on cable yarn. Prefers South, but will go anywhere. Wants $3.50 per day to begin with. 2020, Textile World Record.

Secondhand Spinner. Held positions of charge of cone and tube winding and spooling, also section of spinning frames. Cotton yarns 8's to 100's on twisters, spoolers, winders, warpers. 3030, Textile World Record.

Overseer of ring spinning, spooling, warping and dressing. Will not go South. Middle aged; American; married. Good experience and references. 3059, Textile World Record.

Boss Ring or Mule Spinner. Age 43; English; married. Asa Lee mules, Lowell Machine Shop, Platt, Mason mules; Howard & Bullough, Lowell and Mason frames. Yarns from 5's to 90's. 3001, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 3018, Textile World Record.

Overseer Ring Spinning, Warping and Spooling. Is experienced on white work from Nos. 4's to 30's. Is familiar with Whitin and Lowell Machine Shop spinning frames and spoolers and warpers. Wants $3 per day to start with. Age 39; American; married. 1703. Textile World Record.

WOOLEN SPINNERS.

Overseer of woolen spinning desires to make a change. Is familiar with suiting, union, cassimere, satinet and knitting yarns and all ordinary makes of machinery. 30 years of age; American; married. Good references as to character and ability. 1987, Textile World Record.

Overseer Woolen Spinning. Is thoroughly competent to take charge of a large spinning room. 38 years old; French; married. Has spun yarns for flannels, tweeds and knit goods, also cotton and wool mixes, shoddies, ranging in all from 1/2 to 14 runs. Is familiar with Davis & Furber, Johnson & Bassett, Platt and other makes. Very satisfactory references. 1917, Textile World Record.

Worsted Spinner or Section Hand. Age 22 and unmarried. At present employed, but not satisfied with surroundings. Would accept moderate pay. 1709, Textile World Record.

Boss Spinner. Age 34; Scotch. Worked on all wool, cotton and wool and shoddy mixes. Will not go West, South or to Canada. References. Good experience. 3032, Textile World Record.

Overseer of Woolen Spinning. Age 44; American; married. Worked on cassimeres, flannels, tweeds and dress goods. Johnson & Bassett and Davis & Furber mules. Will not go West or South. Good experience and first-class recommendation. 3049, Textile World Record.

Overseer of Ring or Frame Spinning, or would take superintendent position. Age 41; married. 2040, Textile World Record.

COTTON WEAVERS.

Overseer of Weaving or designer. Lawns, sheetings, twills, sateens, quilts, bedford cords, lappets A young man; unmarried. Good experience and first-class recomendation. 3063, Textile World Record.

Overseer of Weaving. Englishman; 33 years of age; married. Worked on fine lawns, sheetings, sateens and fancies, coarse drills, twills, bicycle cloth, automobile cloth for tires. Familiar with Whitin, Crompton, Knowles, Mason, Kilburn & Lincoln and Lowell machines. 3073, Textile World Record.

Overseer of Weaving. Accustomed to fancies. Can do own designing and figuring. Good references from past employers. Is open to go anywhere. Had experience on many kinds of looms, including the Draper. 1731, Textile World Record.

Overseer of Weaving in cotton mill. Worked on lawns, dimities, sheetings, corduroys, velveteens, etc. Colvin, Mason, Whitin, Kilburn & Lincoln, Knowles and Draper looms. 3011, Textile World Record.

Overseer of Weaving wants position. Practical experience from weaver, loom fixer, secondhand to overseer, on all kinds of looms and make of goods. References. Good manager of help. Married man; 35 years of age. 1806, Textile world Record

Overseer of Weaving. Age 35; Scotch; married. Good experience, and excellent references, Crompton, Whitin, Lowell, Colvin, Woonsocket and English looms. Sheetings, lawns, ginghams, flannels, fine worsteds, dress goods, shirtings and novelty goods. 2016, Textile World Record.

WOOLEN WEAVERS.

Overseer of Weaving, also designer. Men's wear, woolen and worsted, and fancies of all kinds, cotton worsteds, dress goods. Knowles and Crompton looms. Age 35. 3056, Textile World Record.

Overseer of Weaving, or would take good second hand job. Age 42; married. Worked on dress goods, suitings, plaid backs, cloakings, meltons and other classes of goods. Worked on Crompton & Knowles loom. 3016, Textile World Record.

Boss Weaver or assistant designer. Wants position with a firm who is willing to advance a man as he proves himself worthy. 28 years old; married, and a steady worker. For past six years worked in all parts of the weave room and pattern room, pattern weaving and dressing, chain building, harness raising, perching, fixing and regular weaving. Now taking course of study in woolen and worsted designing. Excellent reference. 2019, Textile World Record.

Boss Weaver or assistant superintendent. Worked on all kinds of worsteds and woolens. Crompton & Knowles looms. Wants place at once. Middle aged; English; married. Good experience. Excellent references. 3062, Textile World Record.

Boss Weaver. Aged 38; married. Cassimeres, beavers, kerseys, dress goods, flannels, blankets. Worked on Crompton & Knowles broad looms. Good recommendation. 3066, Textile World Record.

Overseer of Woolen Weaving, or would take a secondhand job. 35 years old; married. Familiar with Crompton & Knowles looms. Good references. 3089, Textile World Record.

DYERS.

Boss Bleacher. Bags, shades, lawns, mercerized, Hollands, book cloth and table cloth. Prefers New York, New Jersey or Pennsylvania. 3083, Textile World Record.

Boss Dyer. Scotch; married. Wool, worsted, carpet and cotton yarn, piece goods, dress goods, raw stock. Will not go West, South or to Canada. Wants $3.50 or over. 3082, Textile World Record.

Dyer, bleacher and washer. Age 30; American; married. Cotton print goods in either the roll or garment, long and short hose, raw stock and yarn, aniline or oxidized black on hosiery. Good references. 3081, Textile World Record.

Foreman Dyer wants position. Age 27; English; married. Cotton and wool in raw stock, wool stock, cotton and worsted yarn and piece dyes, also hosiery. Will not go West or South. Good experience. 3079, Textile World Record.

Dyer. Age 33; Scotch; unmarried. Worked on every kind of woolen cloth, serges, meltons, shoddy worsted and woolen yarn, etc. Wants $5.50 per day. Will not go South. 3064, Textile World Record.

Boss Dyer, mercerizer or bleacher. Scotch, married. Wool, yarns, piece, cotton and slubbing. Can take place at once. First-class recommendations. Familiar with all the latest improved machinery in the dyeing business. 3097, Textile World Record.

Dyer. Worked on piece dyes, wool, cotton, shoddy yarns, rags and union dyes and carbonizing. Wants place at once. Good experience and references. 3092, Textile World Record.

Dyer. Worked on all classes of goods, woolens, worsteds, yarn, piece dyes, slubbing, blue vats and cotton mixes. An American; married. 3085, Textile World Record.

FINISHERS.

Finisher of Cotton Goods, also worsteds, by calender, hot press and beetle, also understands frames, starching and mercerizing. Age 25; English. 3006, Textile World Record.

Finisher, both wet and dry. Age 28; English; married. Shirtings, ginghams, cotton dress goods, mercerized effects and men's cotton suitings and trouserings. Excellent references. 3007, Textile World Record.

Cotton Finisher. Age 27. Worked on prints, lawns, dimities, muslins, ducks, drills, Madras, etc. Understands folding and packing. 3005, Textile World Record.

Overseer of Finishing, worsted goods, white or fancy. A young man; married; English. Has had full charge of piece dye finishing. 3019, Textile World Record.

Boss Finisher. Worked on broad cloth, cheviots, kerseys, coverts, meltons, piece dyes, dress goods. Prefers Massachusetts, but will go anywhere in New England. Not employed and wants place at once. Young man; American. 3046, Textile World Record.

Boss Finisher in a woolen mill. Worked on kerseys, meltons, cassimeres, satinets, cheviots, etc. Wants $3.50 per day. Will not go to Canada or West. 3077, Textile World Record.

Overseer of Finishing. Age 32; American. Woolen and worsteds, suitings, coatings, cloakings, cassimeres, cheviots, meltons, frieze, etc. 2070, Textile World Record.

KNITTERS.

Knitter. Worked on light and heavy weight ladies' ribbed vests and shaped vests, and all kinds of common knit goods. Familiar with Champion, Nye & Tredick, Star, McMichael & Wildman machines. Wants work in Pennsylvania. 3037, Textile World Record.

Superintendent or Machinist. Age 36; English; married. Worked on underwear, ribbed and plain; sweaters, circular and flat; hosiery, circular and full fashioned. Will not go West or South. First-class recommendation. 3095, Textile World Record.

Knitter. Worked on light and heavy weight ladies' ribbed vests and shaped vests, and all kinds of common knit goods. Familiar with Champion, Nye & Tredick, Star, McMichael & Wildman machines. Wants work in Pennsylvania or Western States. 3037, Textile World Record.

Boss Knitter, finisher or machinist. Worked on nearly all kinds of knit goods, and nearly all kinds of latch needle knitting machines and all kinds of machines used in finishing underwear. 889, Textile World Record.

Overseer Boarding and finishing hosiery. All kinds of men's, women's and children's hosiery, except silk. Age 41; American; married. Can furnish references. 3035, Textile World Record.

Asst. Superintendent or Boss Knitter. Age 29, strictly temperate and held position of boss knitter for past four years running. Fleeces, balbriggan and flat work on spring needles, and plaited, straight and shaped work on several makes of latch needles. Can give best of references. 1492, Textile World Record

Superintendent of knitting mill, or foreman in large plant, is open to position. Had some 15 years' experience as machinist, foreman and superintendent. Familiar with all grades seamless hosiery and most makes of seamless hosiery machinery. Understands business from starting new mills to finish. Perfectly sober and reliable. 3078, Textile World Record.

DESIGNERS.

Designer or assistant superintendent. Worsted dress goods, fancy cotton waistings, corduroys, worsted suitings. Wants place at once. Age 31; English; married. 3080, Textile World Record.

A First-Class Designer or superintendent desires position. Understands vestings, dress goods, silk labels, shoe facings, shoe straps, shirt labels and tapes of all descriptions. Large experience on Jacquard work. Age 26; single; English. Strictly temperate. 1773, Textile World Record.

Asst. Superintendent or Designer. Familiar with men's wear, overcoatings and fancy worsteds. A young man. Taken post graduate course at Yorkshire College, Leeds, England. Attended Philadelphia Textile School a year and graduated from Lowell Textile School. Bright and of good character and habits. 3096, Textile World Record.

MISCELLANEOUS.

Wanted, by a hard working, industrious man (English) a situation as fixer, second hand or overseer in tape mill. 1826, Textile World Record.

Loom Fixer. Age 27. Knowles and Crompton looms. Wants not less than $2.25 per day. Will not go West or to Southern States. 3014, Textile World Record.

Salesman for hosiery and underwear. Age 37, single. Can furnish references. 3060, Textile World Record.

Master Mechanic, or mechanical superintendent. Many years' experience in general machine work and mill engineering. References. 3067, Textile World Record.

Fixer of sewing machines. Is familiar with machinery of all kinds that is used in making up and finishing knit underwear. Will not go West or South. Wants place at once. References. 3068, Textile World Record.

Master Mechanic in cotton mill. Wants $1,500 to $2,500 per year, according to duties and position. Can take place at once. Will not go to Western States or Canada. Familiar with steam engines, pumps, boilers, water wheels and complete cotton mill equipment. 3039, Textile World Record.

Second Hand in cloth room desires position. At present has charge of samples in large mill. Has worked on all classes of cotton goods. Strictly temperate. 3043, Textile World Record.

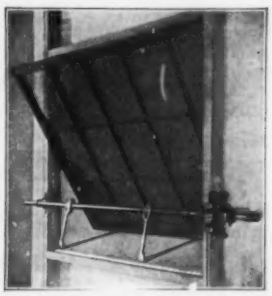
Overseer of Warping, Spooling and Winding. Dress goods and cloth. Will not go to Canada. Aged 40; married. Good experience. References. 3027, Textile World Record.

Asst. Superintendent. Young man, 26, graduate of Lowell Textile School (Woolen and Worsted Course). Has had considerable experience in setting up machinery, and worked in nearly every department of mill. Wants position in which there is a good chance to advance. 3040, Textile World Record.

Roll Coverer wants an opening for work. Can cover cotton or worsted rolls, make aprons, or better, has had large experience. Can furnish tools. Work by piece or day. 1803, Textile World Record.

Loom Fixer or boss weaver. American. Familiar with all kinds of looms. Can take place at once. A good, steady man, and thoroughly reliable. 3091, Textile World Record.

Machinist. French; married. Has had full charge of all kinds of repairing. Understands all about boilers, engines, motors and can give best of references. 3090, Textile World Record.



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For Raising Monitor and other Ventilating Sashes for Factories, Mills, Store Buildings, etc.

Long lines of Sashes can be swung easily and evenly to any desired opening. It is self-locking at any point.

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Designed to assemble parts of machinery and to convey from one machine and one part of the factory to the other—**its value** can be appreciated in the erecting room.

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TRUCKS For Dye Houses, Finishing Works Cotton or Woolen Mills.

JOHN W. FERGUSON,
Builder and General Contractor.

MILL BUILDING A SPECIALTY. References made to some of the largest mill owners in the Middle States, including Clark thread Co., Newark, N. J., Barbour Flax Spinning Co., Paterson, N. J., and others.

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Fancy Cotton and Woolen Cloths from Samples,

Giving full instructions for reducing drafts as well as the methods of spooling and making out harness for cross drafts and finding any required reed. Size of book, 16 x 11 inches. Has 52 illustrations, many of them large pattern sheets on regular design paper. This book has had a wide sale, and when these few copies are sold will probably be out of print.

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New Machinery in Every Branch of Textile Manufacturing

The New Buildings now completed afford unexcelled advantages for pursueing the work of the several departments.

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Especially attractive are the openings which exist in the territory traversed by the great textile lines to the South,

Southern Railway, and Mobile & Ohio Railroad

for the successful establishment of

Cotton Mills, Woolen Mills, Knitting Mills,

or any class of textile plant, for which the manufacturer seeks a location. Advantages and national resources of ten states to select from. Abundance of Raw Material, Cheap Power, and First-class Transportation Facilities.

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M. V. RICHARDS, Land and Industrial Agent, Washington, D. C.

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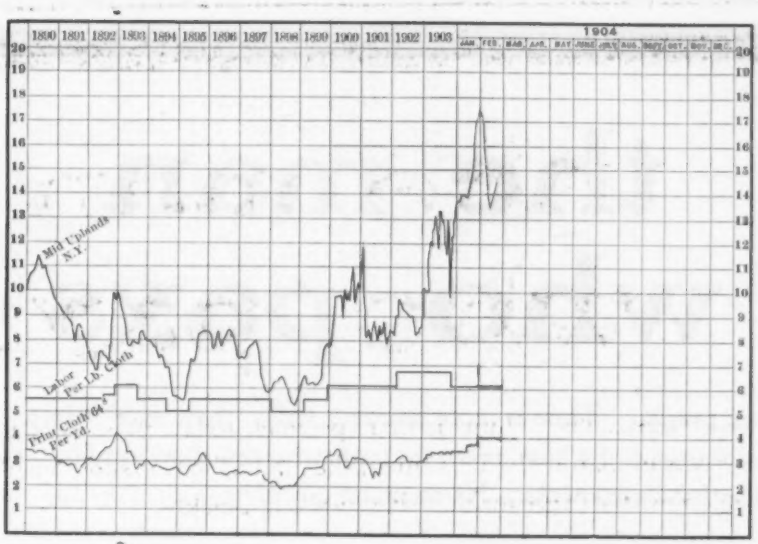

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The Cotton Market.

Since our last report was written middling uplands cotton has taxed the capacity of our chart by rising to 17 1/4 cents, a record that has not been exceeded in the past twenty-five years. This upward movement was in large measure due to the speculation for future delivery, which has been rampant on the various exchanges.

Business in the spot market has been of small proportions as the manufacturers are still facing prices for goods based on 12-cent cotton, and evince no enthusiasm in becoming owners of cotton at 3 cents per pound above that level.

The decline following the record price of 17 1/4 cents had no effect on the price of cotton goods. It is becoming evident that the scarcity of cotton is being transferred from the raw material to the goods market. Buyers of the finished product are naturally unwilling to pay the prices made necessary by 15-cent cotton, but they find manufacturers still more unwilling to sell goods at a loss. The result has been more or less of a dead-lock, broken only by merchants who have found it necessary to replenish stocks in order to continue in business. They find no large stocks of goods to draw from and in some cases have been forced to order at material advances and then wait until the goods are made. Comparatively few contracts for the future delivery of goods have been made, however, and the result is a waiting market.

The statistical position of cotton continues strong. The Chronicle estimates the world's visible supply Feb. 26 at 3,752,685 bales, as compared with 3,950,562 bales at the same time in 1903, 4,440,065 bales in 1902, and 4,019,890 bales in 1901.

C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Sec'y.
Established 1860—Incorporated 1893.
THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
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is a result producer, logical, economical, practical, not an accident, but a material whose valuable detergent properties are due to new principles, new facts. We have told you how Wyandotte Washing Soda gives a cleaner, whiter, softer and loftier wool,—how it gives to the finished cloth that desirable softness and firmness of texture. We have quoted to you the words of others, telling of their success. We have done more, having repeatedly guaranteed that the result would be all we claimed or cost you nothing.

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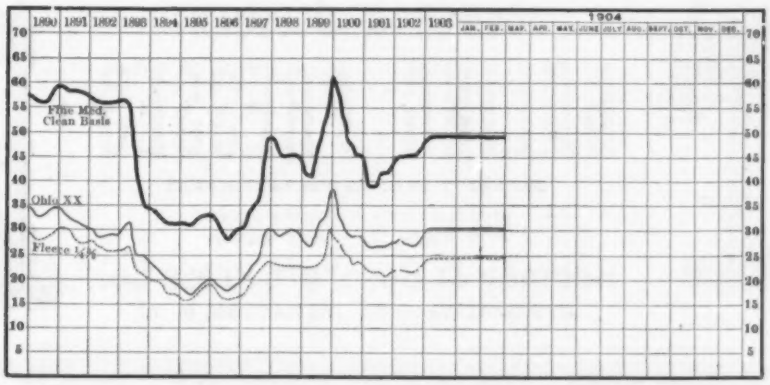

CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

The Wool Market.

Several influences have served to keep the wool market in a quiet condition. First, the unsatisfactory state of the goods market has reduced the demand for wool and discouraged manufacturers from purchasing raw material unless it was actually required for orders. The demand for goods has fallen far short of what is required to keep the woolen and worsted machinery in operation and it is a rare exception to find a mill busy on orders. Another factor in the situation is the scarcity of really desirable grades of wool. At this season of the year, just previous to the approach of the new clip, the selection is almost always poor and this year is no exception to the rule. The most limited supply is found in 3/8 and 1/4 blood wools for which the demand has been strongest during the past season. There is a much larger stock of medium grades. This is especially the case with fine medium territory and as a result this quality is the weakest on the list.

To the unsatisfactory condition of the goods market and the time of the year may be added the feeling of uncertainty among business men regarding the current of trade during the coming year. While not anticipating any serious set-back, the prevailing sentiment is that business during the presidential year will be slow and that textile manufacturers will not be excepted. Dealers in carpet wools have been less inclined to sell during the past few weeks owing to the outbreak of war in the East. Asking prices have been slightly raised and in some cases buyers have paid the price. Stocks are small, and this fact exerts a strong influence in maintaining prices.

The new clip has appeared in the southwestern markets. It is reported that buyers are very conservative and sales have been small. Eastern dealers have found that their enthusiasm of a year ago which resulted in large purchases of the new clip at high prices were not warranted by trade conditions, many of them have paid for their error by carrying a heavy load during the past year.

The present price of wool is neither low nor high; 48 to 50 cents for fine medium territory offers no strong inducement for manufacturers to substitute shoddy for wool, consequently a material decline is not to be expected.

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Fine, Medium and Coarse Wool Tops. Mohair Tops. Camel Hair Tops. Fine, Medium and Coarse Wool Noils. Mohair Noils. Camel Hair Noils. Silk Noils.

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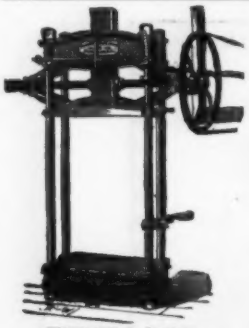

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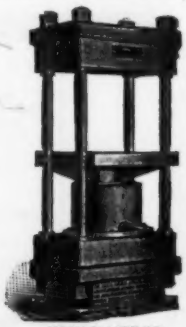

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IMPROVED UPRIGHT SPOOLERS
TO SPOOL FROM COP, SKEIN, OR BOBBIN.

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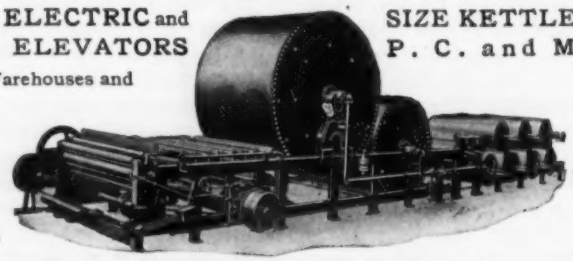

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Will Outlast Three Ordinary Valves.

Made for hot or cold water or any fluid where rubber valves are used. By its construction will outlast several ordinary valves. A trial will demonstrate the truth of our statements.

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Pressure and Vacuum Gages. Pop Safety Valves.
Steam Engine Indicators. Whistles, Lubricators, Etc., Etc.

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CROSBY STEAM GAGE AND VALVE CO.,

Stores: Boston, New York, Chicago, London.

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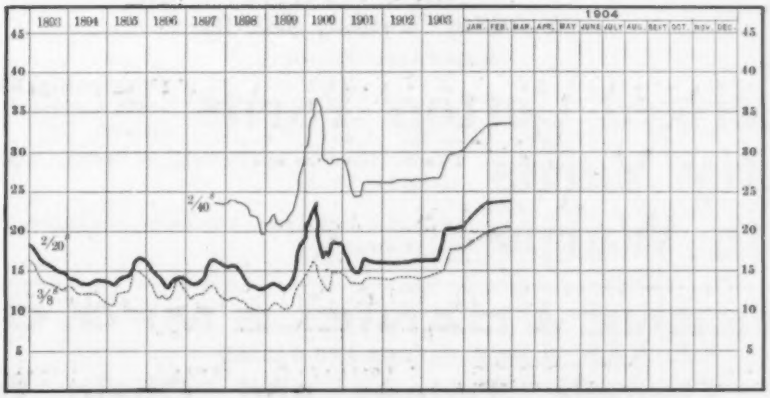
Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Cotton Yarn Market.

This market is in such a demoralized condition owing to the fluctuations in the price of the raw material that it is impossible to give the reader any clear idea of the existing conditions. Each transaction hinges on individual conditions such as the stock of cotton yarn held by the spinners. The buyers are demanding lower prices on account of the drop in cotton, but are met with the argument on the part of the spinner that the price of yarn has been far below the cost of the production and that the decline in the cost of the raw material has served simply to reduce the loss to the spinner, instead of making it possible for him to sell yarn at a lower price.

The price of yarn has been not so much on the quotation for cotton futures as upon the cost of spot cotton. The decline in spot cotton has been much less than in futures and this is an additional reason why spinners are unwilling to make concessions on yarn. Stationary conditions are not likely to be reached for some time as all branches of the textile trade are in a period of transition adjusting themselves to 14-cent cotton. There are reports of cutting prices on yarn, and such action has been taken by dealers who are carrying large stocks and whose financial necessities made it necessary to unload regardless of the condition of the market.

The demands for both woolen and knitted cotton goods is much restricted owing to the high price prevailing and this is an additional reason for the small volume of trade in yarn. No spinner with any regard for solvency will think of making contracts for delivery of yarn at any material concession under prevailing prices. The trade have quite generally come to the conclusion that the days of 8 and 10-cent cotton are gone for good. If this is the case the price of yarn and goods must advance regardless of the resistance offered by buyers. We quote as follows, the prices given being nominal:

Eastern Cops.

6's	22¼
8's	22½
10's	23
14's	24
16's	24½
18's	25
20's	25½
22's	26
24's	26½
26's	27¼
30's	28½
34's	29½
36's	30½
40's	31½

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	25
14's	26
18's	27
20's	28
22's	28½
26's	29
28's	29½
30's	31
36's	33
40's	35
45's	38
50's	40
55's	44
60's	49

Eastern Two-Ply Warps, Carded Peeler.

2/30's	31-32
2/36's	34
2/40's	34-35

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

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GREENE & DANIELS MFG. CO.,

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Yarns, Threads, Twines and Chain Warps,

Colored and Bleached Yarns Furnished in any manner desired by the trade.

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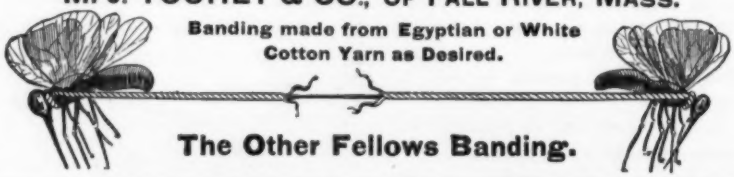
Banding made from Egyptian or White Cotton Yarn as Desired.



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COTTON WARPS

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4s to 60s.

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WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

2/45's	37-38
2/50's	40-42
2/60's	50-52

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	37
35's	38
40's	40
45's	43
50's	45
55's	51
60's	55½
70's	59½

Two and Three Ply Skeins, Combed.

30's	40
36's	42
40's	44
45's	47
50's	52
55's	55
60's	58
70's	65

Philadelphia Yarn Market.

The yarn market has suffered a relapse from the strong and flourishing condition it was in about the 1st of February. Prices have been thoroughly unsettled and trade demoralized. Any business that has been done, has been in small volume, as customers generally lost confidence in the yarn market as soon as cotton began to drop.

The holders of spot cotton have not followed the market on futures, and while options have been quoted as low as 13c., spinners have not been able to buy good grades of spot cotton within 1½c. per pound of this price. Southern spinners are not anticipating any low priced cotton during the remainder of this season, and are not willing to discount the market on contracts for future delivery

There has been rather a sharp decline in the price of some numbers of yarn, but we do not think cutting has been done by spinners on new contracts. It has been done more by dealers who are anxious to unload stocks, which they had bought early in the season at lower prices. The market has been steadier the past few days—with a little better feeling amongst buyers, but the consumption of yarn has been curtailed largely and mills running exclusively on cotton goods report dull business.

The following quotations will give an index of the market as it stands today:

Southern frame cones (good quality):—

7's and coarser	21½-22
8's and 9's	22¼
10's	22½
12's	23
14's	23½
16's	24
18's	24½

PAULSON, LINKROUM & CO.
Successors to BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
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302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
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Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers.
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MERCERIZED TURKEY RED GASSED } COTTON YARNS.
Ramie Yarns for Knitting or Weaving.

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MERCERIZED YARNS
Two and Three Ply, for all purposes,
In Peeler, Egyptian and Sea Island, gassed and ungassed, natural and dyed. Fast Black for cross dyeing a specialty.

MOELLER & LITTAUER,
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey-Red, Embroidery Yarns.
109 GREENE ST., NEW YORK.

CAPACITY, 50,000 Spindles. **ORSWELL MILLS** FITCHBURG, MASS.

COMBED **COTTON YARNS** CARDED

In Chains and Skeins, on Balls, Beams, Spools—Single or Twisted.

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.

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Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

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Consignments Solicited for Southern Mills. Liberal Advances Made and Sales Cashed Promptly.

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Cotton Warps and Yarns. In Gray and all Colors, Single or two or more Ply, and Cable Cord.

Novelty Yarns. in Various Patterns, Colors and Twists.

Carded and Colored Cotton. For Mixing with wool, Machined or in Roving.

Indian Orchard, Mass.

J. MORGAN, PRES. H. K. WRIGHT, TREAS. W. C. GODFREY, AGT.

20's	25
22's	25½
24's	26
26's	26½
30's	27
40's	32
50's	37

Southern high grade mule yarn:—

Cones.

10's	23
12's	24
14's	24
16's	25
18's	25
20's and 22's	26
24's	27

Southern frame yarn, lower grades:—

6's and 8's	21
10's	22

Eastern cones (high grade quality):—

10's	23½
12's	24
14's	24½
16's	25
18's	25½
20's and 22's	26-27

Skein yarn (mostly Southern):—

4's to 8's soft	21-21½
10's to 12's	21½-22
14's to 20's	22½-24
22's	24½
14/2	23
16/2	24
20/2	25
30/2	27
40/2	33
16/3 slack	23½
12/3 slack	22½-23
8/3 carpet	21-22
8/3 slack	22
9/4 slack	22

Warps (mostly Southern):—

10's to 12's	22½-23
14's	23-23½
16's	24
20's to 22's	24-25
26's	25-25½
14/2	24
16/2	24½
20/2	24½-25
24/2	26-26½
30/2	27½-28
40/2	33-34

Mixed colored yarns (mock twist, half colors):—

6's to 10's	24
12's to 14's	25-26
16's to 18's	27-28

Silver and jaeger, 1½c. over white.
Mock Egyptian, 2c. advance over white
Egyptian, 4c. to 5c. above best quality white

Reels for Cotton WOOLEN AND WORSTED
Patented Hosiery Winders, Cop Winders and Spoolers.
LINDSAY, HYDE & CO.,
2124 to 2130 East York St., PHILADELPHIA, PA.

TRY OUR
Silkine, also Lisle Silk
FINISH
—FOR—
Hosiery, Knit Goods, Yarn, Fast Black, Harsh Colors, and Fibres.
O. K. SOAP CO., 968 Franklin St., PHILA.

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COTTON YARNS OF EVERY DESCRIPTION.
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LINEN YARN IMPORTER.
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Flax, Hemp and Jute Line and Tow Yarns, For Weaving Purposes.
Linen Jacquard Harness Twines, Fine Cotton Harness and Heddle Twines, For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

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Skein, Warps, Cones, Cops, Tubes
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EDDY & STREET,
Cotton, Woolen,
Yarns and Braids
Worsted, Spun Silk.
PROVIDENCE, R. I.

Walcott & Campbell Spinning Co.
Fancy Hosiery Yarns
IN ALL COLORS
New York Mills, Oneida Co., New York

ALLEGHENY WORSTED MILLS,

Thomas Wolstenho'me
MANFRS. OF Sons & Co.,
ALL NUMBERS
SINGLE AND TWO-PLY,
On Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural and Fancy Mixes.

Worsted
YARNS
Sell Direct,
Office and Mills, Frankford Ave. and Westmoreland St., Phila, Pa.

POCASSET WORSTED COMPANY,

Worsted Yarns.

OFFICES:
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PROVIDENCE, R. I.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—White or colors, in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

DYERS OF YARN AND SLUBBING. BRISTOL, R. I.

French System. Bradford System.

B. F. BOYER CO.,

MANUFACTURERS OF

WORSTED AND WOOLEN YARNS,

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Hegeman Seamless Bobbin Cover.

The best, cheapest and most satisfactory covering for winder bobbins. Will fit on any style or size.

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SOLE AGENT FOR
Adams' Patented Latch Needles

RICHARD CAMPION,

Selling Agent for
BRISTOL WORSTED MILLS,
HIGHLAND WORSTED MILLS.

Worsted Yarns

ALL QUALITIES AND NUMBERS.

17 Bank Street,
PHILADELPHIA, .. PA.

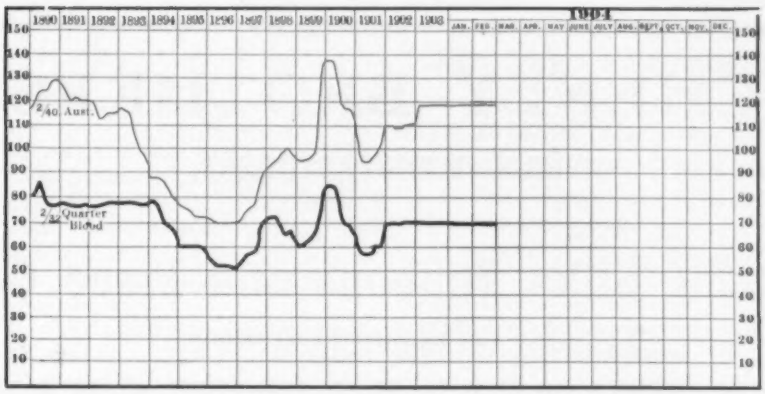


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

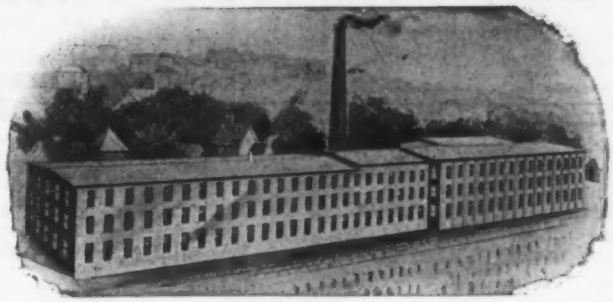
Worsted Yarn.

Spinners are getting some orders but are not making money out of the business. Many are manufacturing at a loss, and the orders secured have been taken at low price in order to keep the machinery going. This all applies to spinners of English spun yarn. There has been more or less inquiry for yarn, but spinners are no longer willing to sell at the former low range of value, especially on 1/4 to 3/8 Blood yarn, which have been advanced 2 1/2 to 5 cents per pound.

The spinners say that bright wool 1/4 and 3/8 Blood, suitable for worsted purposes, are held very firm, and quarter blood wools are particularly scarce. The result is that spinners must get a considerable advance on yarn, and must have at least 2 1/2 cents per pound, and at this they are not holding their own. When this state of affairs has been explained to possible buyers, the salesman is informed that they will not buy any until May, as they had yarn enough to carry them until that time, and were willing to buy only at old prices or lower. Some of the spinners made very low prices in December in order to get business and the weavers, although not covering for all requirements, find that up to the present time they ordered more yarn than will take care of present requirements.

The weavers have not secured all the orders expected, as the trade seems cautious about placing large orders. One weaver said on receiving an

SILK NOILS AND SILK NOIL YARNS
In White and Colors.
A. T. SKERRY & CO., 47 Leonard Street, NEW YORK.
MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

QUEENSBURY MILLS WORCESTER MASS.
MOHAIR TOPS AND YARNS FOR WEAVING
LUSTRE YARNS FOR SERGE LININGS
ALPACA YARNS

SPINNERS OF MOHAIR YARNS FOR ZIBELINES
DRESS GOODS YARNS
KNITTING YARNS
WORSTED YARNS
MOHAIR

CHENEY BROTHERS,

SILK MANUFACTURERS,

——ALL KINDS OF——

Knitting Silks, Ribbons and Piece Goods

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, IN THE HANK, OR ON CONES, FOR MANUFACTURERS' USE. SILK FOR SPECIAL PURPOSES MADE TO ORDER.

Mills: SOUTH MANCHESTER and HARTFORD, CONN.

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929 Chestnut Street, PHILADELPHIA.
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WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

E. G. HARPER,
WORSTED and WOOLEN YARNS,
MERCERIZED COTTON,
395 BROADWAY, TEL. 1020 FRANKLIN NEW YORK.

Speed & Stephenson,
WORSTED and WOOLEN
YARNS
A SPECIALTY.
ALSO TOPS.
170 SUMMER ST., BOSTON.
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Crochet Lace Edgings

Spun Silk, Splicing Yarn, Mercerized Yarns, Cotton Warps, Sewing Threads, Tapes, Braids, Domets, Cambrics, Silesias. : : :

Write for Prices and Samples.

George W. Chapin 229-231 Church St. PHILADELPHIA

order for a sample piece, that he hoped the time would again come when he could make enough cloth to keep a loom going on some one style for more than 24 hours. Weavers of worsted, who generally run full, are finding it hard work to keep their looms running more than full time. The weavers doing the best are those making mercerized worsted cloth. Cotton worsteds are being sold by certain mills who own yarn at prices before the advance. There may be cloth enough selling, but it certainly is not worsted cloth.

The business so far secured has been on cheap shoddy woolens and on cloth made from carpet wool. Speaking in a general way the weavers of worsted cloth have not placed more than one-half their usual orders for worsted yarn and spinners if they do not now realize what they are up against, will do so before a month or so is over.

Fine yarns strengthened, but not many orders have been placed for fine yarn. The improvement has been caused by the firm position of fine wool and not by the demand for fine English spun yarn. A large quantity of fine white tops has been "kicking" around the market. These tops were made on speculation and were a drug on the market. The prices quoted were lower than what the wool could be bought for and put into tops. Within the last two or three weeks these tops have all been sold at very low prices, and it will be necessary for spinners wanting tops to pay a much higher price. It is not too much to say that thousands of dollars were lost on these top deals.

There is a story that a certain large manufacturer being desirous of bearing the wool market, lowered the opening prices of his goods. In order to try and carry out his plans so that he could continue to sell on the low level, he tried to break the wool market. He went to a certain large wool dealer and told him confidentially before he opened his goods that within two or three days he was going to open at a reduction over the previous year, and that he supposed it would effect the wool market

JENCKES SPINNING CO.,
Formerly E. JENCKES MFG. CO.
Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.
PAWTUCKET, R. I.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.

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COMBED AND CARDED COTTON.
YARNS 40's and above. AND
FITCHBURG, MASS. WARPS

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Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

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COMBED and CARDED
COTTON YARNS
From Northern and Southern Mills.
American, Egyptian, Peruvian and Sea Islands.
ARNOLD B. SANFORD, Pres. and Gen. Mgr.
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OFFICES: 67 Chauncy St., Boston.
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HOFFMAN, DeWITT & McDONOUGH,
Diamond Stay Bindings TRADE MARK
Manufacturers of
Tapes, Webbing and Bindings.
COTTMAN and G STS., PHILADELPHIA
Ryer's Station, P. & R. R. R.
Bell Telephone, 203 Cheltenham.

Never Shrink
SOMETHING NEW
Prevents Woolen Goods from Shrinking
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Charles H. Heyer
BUSTLETON, ... PENN.

WEIMAR BROS. MANUFACTURERS OF Cotton Mercerized Tapes,
SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.
Phone Connections. Works, 2046-48 Amber Street, PHILADELPHIA, PA.

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Eaton Rapids Woolen Mills,
EATON RAPIDS, MICH.

JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Phila.

Woolen and Merino Yarns,
1 to 10 Runs, at reasonable prices.
All Wool, Mohair and Wool Spun or Mixed Cotton and Shoddy Yarns, in white, gray, and colors.
Dress Goods Yarns a Specialty.
E. M. ROCKWELL, - - LEOMINSTER, MASS.

Knitting and Weaving YARNS.
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
EDWARD S. HYDE,
226 CHESTNUT STREET,
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SHODDY WM. H. H. SLACK & BRO., Springfield, Vt.
Carbonized Stock a Specialty. **FLOCKS**

You Save Enough Insurance to Pay for the Equipment
So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK. Fully approved by all insurance companies. We equip factories with Fire Alarm, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time. Send for particulars.
Pettes & Randall Co., 150 Nassau St., New York

and warned him to protect himself. The wool merchant was not disposed to get frightened, and the price of wool did not go down.

The cut was made in worsted cloth, but the only effect was that the woolen concern had to advance prices on cloth, and the net result was that the move only unsettled the goods market. It was found out afterward that the friendly tips had been given to three or four wool merchants selling wools suitable for worsted yarn.

The dress goods manufacturers are beginning to get orders, but there have been no heavy orders placed as yet. There are many fancy yarns in demand. Much 2/36s is being required, but buyers do not take kindly to the advance. Much hard twisted 2/50s yarn is being used. Whatever may be the condition of the English spun yarn, French spun yarn is selling well and at a profit. Yarns have advanced on coarse grades about 2 1/2 cents per pound; on medium yarn about 1 1/2 cents and on fine yarn about 3 cents per pound.

The knitters have placed orders, and many were booked in January, but they have not entirely covered for their requirements, and more will be placed between now and June. The combing mills are not busy, but the price of tops is well maintained now that the speculative tops are cleaned out. Business comes slowly and unsteadily. Good business results one week only to fall off materially the week following.

The Clay worsted business seems to be a thing of the past. Spinners making yarn for this cloth must find a different outlet. We quote as follows:

2/40's Australian	1.20
2/40's XX Delaine	1.10
2/40's Half Blood	1.05
2/20's Half Blood	.85
2/36's 3/8 Blood	.75
2/26's 1/4 Blood	.68

Woolen Yarn.

Spinners of woolen yarn continue fairly busy and all the spinners who make yarn of commission have all machinery employed. The demand comes from woolen mills which are running much woolen spinning outside their own mills. The woolen mills making a cheap cheviot and cheap fancy cashmere out of shoddy and carpet stock have been busy. Then again the eiderdown manufacturers are having much yarn made on outside machinery. The rubber boot lining trade is calling for much yarn out of which to make linings.

The lining business has been particularly good this season on account of the winter. The spinners of sale yarn have been securing many orders and those buyers who have delayed purchasing hoping for lower prices, are liable to be unable to get

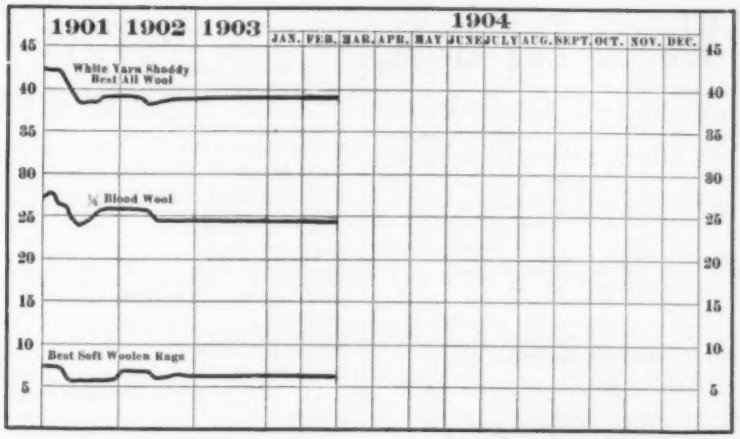

CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

orders placed when ready as the woolen spinners are booking many orders.

There is much merino yarn being placed, both from hosiery and fleece-lined underwear mills. Some of the spinners making these yarns and using Peruvian cotton bought the wool to fill orders, but did not cover on cotton and found when wanting the cotton that the prices on cotton had advanced to such an extent that the orders for yarn had to be made without profit. There will not be so much all wool yarn used by the hosiery manufacturers this year as heretofore, as worsted yarn will be substituted.

The knitters throughout New York State are busy on certain lines of underwear, but have not received orders for their regular lines. The fleece-lined cotton underwear is proving to be a bad investment, and many of the mills are selling out. In the future more all wool underwear will be used, as the test put on fleece-lined underwear by the present hard winter has proved that 39 cent cotton shirts is a bad investment, that what was saved in the price of the shirt was lost in the doctor's bill.

The knitters are not heavily stocked with yarn or wool, and are buying from hand to mouth, as orders come in. There will be much better material used. More Australian lambs' wool, Australian thread waste and tops. The business is not yet fully started, but during March it will develop and many orders for yarn and material will be necessitated.

Dyed black tops used by some manufacturers are found to be very expensive at any price. We hear one knitter who always bought dyed tops has found that they are expensive. This knitter got them in his underwear and the color in the tops ran and spoiled his garments. It goes to prove that the natural black tops are best even if costing more, as a better color is secured without risk of getting colors which are not fast, as there is no coloring matter in a natural black. Thread waste is in demand and prices are firmly maintained.

Rag and Shoddy Market.

A hand to mouth trade has continued to be the rule in these markets for the last month. Shoddy manufacturers have bought rags only to supply their immediate requirements and as a result the rag dealers have been compelled to carry their stocks. The severe winter weather caused an accumulation of rags in the country and had a temporary effect on prices, leading the rag dealers to assume a firmer attitude. This, however, was only a passing phase of the situation and the milder weather during the recent weeks has enabled shippers to send in liberal supplies.

The unsatisfactory condition in the goods market is the chief factor in the rag and shoddy markets today. As noted in another part of this issue the mills have been unable to secure sufficient orders to keep them fully employed, and as a consequence have used less than the usual quantity of raw material. Buyers of goods have shown a disposition to make manufacturers carry the stock to a greater extent than has been the case in other years and the manufacturer has followed suit by restricting his purchases of the raw material to the lowest terms.

While the situation is unsatisfactory, yet there is no danger for apprehending any serious developments. The general prosperity of the country has continued and the depression in the textile markets is looked upon as a natural accompaniment of the presidential year and also as a legitimate reaction from the recent activity.

Wool waste has been active in spots. We hear of considerable activity in the trade of some dealers. The cotton waste market has been unsettled, owing to the state of the cotton market. There has been a fair demand for the better grades of waste, but they are in limited supply. Under these circumstances quotations are largely nominal.

SHODDIES AND EXTRACTS.

White yarn, best all wool	38-40
White knit, all wool, best, fine	28-32
White knit, No. 2	23-25
Light yarn, extra fine	25-28
New pure indigo blue	23-25

Cotton Waste For Sale.

Have large lines of Soiled Card, white and colored Oily Card and other Cotton Wastes suitable for the manufacture of Cassimeres, Satinets, Unions, etc. Also Combers and other clean Cotton Wastes for Hosiery, Underwear, etc.

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RIVERDALE WOOLEN CO., MANUFACTURERS OF

.. Shoddies ..

Of every description. Capacity 7,000,000 pounds per annum. Custom Carbonizing and Garnetting a Specialty.

New York Office. 140 DUANE STREET. **RIVERDALE, NORTHBRIDGE, MASS.**

Merino.

Fine light, all wool, No. 1	24-25
Medium light, all wool, No. 1	16½-17½
Medium light, all wool, No. 2	14-16
Fine black, all wool	20-22
Fine dark, all wool, best grade	20-21
Medium dark, all wool, No. 1	13-15
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	19-20
Red flannel, all wool	19-20
Dark blue for hosiery, strictly all wool, No. 1	17-20
Dark blue for hosiery, not all wool, No. 2	12-14

DELAINE EXTRACTS.

Light	19-22
Medium light	15-17

WOOLEN RAGS.

Regular gray	12-13
Black	14-15
Fancy colors	16-20
Fine merchant tailors, all colors	9-11
Choice light colors	13-15
Browns	12-13
Blacks	9½-10½
Fine blues, plain	9-11
Fine dark	10-11
Medium dark	7-8

Worsteds.

Blue	16-18
Black	18-20

Serges.

New black	15-16
New blue	14-15

Flannels.

New scarlet	18½-22
New blue	17-18
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	7-7½
Old white flannels	14-16
White flannels, No. 2	11-12
Old red flannels	9½-10
Light blue flannels	7½-9
Old blue flannels	6-7
Fine worsted, new black	26
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20
Old plaids	5-7
White stockings	17-18
White hood stock	20-21
Clear hoods	9-10
Red stockings	9-10
Blue stockings	7-8
Fancy stockings, No. 1	7-9
Gray stockings	9-10
Black stockings	9-10
Knit stock comforters	6-7½
Red knit	9-10
Light gray knit	9-10
New light fancies	16-18
New fancies	12-14

Merinos.

Light, fine	13½-15
Light, coarse	7¼-8
Fine, dark	12-13
Dark, No. 2	8-9
Coarse dark	5-6
Blue	12-13
Blue—seamed	13-14
Black—unseamed	12-13
New black	18-20
Small	3¼-4
Bunting	6-8

FLOCKS.

Shear, fine white, all wool	9-11
Fine indigo blue, all wool	9-9½
Fine black, and blue, all wool	7-8
Fine dark, all wool	5-6
Gig, fine, all wool	3-4
No. 1, black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3½

COTTON WASTE.

No. 1 Spinners	12-12½
No. 1 Machine	7-7½
No. 2 Machine	5½-6¼
Machine Cop	8-8¼
No. 1 Cop	10½-11
No. 1 Card	11½-12
No. 2 Card	10-11
No. 1 Oily Card	5½-6
No. 2 Oily Card	4-4½
Egyptian Card	None in the market
Peeler Combing	12½-13
Egyptian Combing (scarce)	None in the market
No. 1 Linters	6½-7
No. 2 Linters	6-6½
White Clips	8¾-9¼
Colored Clips	5½-6½
No. 1 Picker	2-3½

NOILS.

Australian	48-50
Fine domestic	38-40
½ Blood	24-28
⅜ Blood	22-23
¼ Blood	17-19
Braid	21-22
Carpet (white)	14-18
Carpet (colored)	10-12½

Seedy.

½ Blood	35-37
⅜ Blood	27-30
¼ Blood	23-26

FIRTH & FOSTER CO.,

Dyers and Finishers of Dress Goods, Men's Wear and Cloakings, such as Venetians, Armures, Soleils, Crepons, also Silk Warp Fabrics, Cotton Warp Linings, Suitings, Clays, Serges, Worsted Damasks, Tapestries and Shirtings.

Particular attention given to Fast Colors on Cotton and Worsted Yarns, Slubbing and Stock Dyeing. Special Black for the Silk Trade on Fine Cotton Yarns.

MAIN OFFICE AND WORKS:

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NEW YORK OFFICE: Silk Exchange, 487 BROADWAY.

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Textile School

TWENTIETH YEAR.

Oldest in America. . . .
Most Complete in the World.

Endorsed by the leading Educators and Manufacturers.

Cotton, Wool, Worsted and Silk

Instruction given in Designing, Weaving, Carding, Spinning, Chemistry, Dyeing and Finishing.

1903-4.

Day Classes open September 28th, 1903.
Evening Classes open October 5th, 1903.

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NEW BEDFORD Textile School

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America's Model Textile School.

Founded by the Commonwealth of Massachusetts and the City of New Bedford.

Equipped with standard mill machinery of the best American and English makes.

Instruction in Picking, Carding, Spinning, Weaving, Designing, Knitting, Chemistry, Dyeing, Mill Engineering, Etc.

Free Catalogue sent on application to

H. W. Nichols, PRINCIPAL.

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COVENTRY, R. I.

Exclusive Trade Mercerizers, Cassers, Dyers and Bleachers of Cotton Warps and Yarns.

Highest Lustre, Permanent Soft Finish, at Lowest Market Prices Guaranteed.

CONING AND WINDING. WE SOLICIT A TRIAL ORDER.

The WM. H. LORIMER'S SONS CO.,

Manufacturers of

MERCERIZED YARNS

FOR ALL PURPOSES.

MERCERIZERS AND DYERS.

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Ontario and Lawrence Sts.,
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R. GREENWOOD & BAULT,

DYERS, BLEACHERS AND MERCERIZERS

OF COTTON WARPS AND SKEIN YARNS.

Globe Bleach and Dye Works,
Oxford and Worth Sts., Frankford, Pa.

140 Chestnut Street, PHILADELPHIA.

TURKEY RED AND FAST BLACKS A SPECIALTY.

W. M. DREXLER & CO.,

Worth and Cranite Sts., Frankford, Phila.

FANCY COLORS on COTTON YARNS

We are Dyers of all kinds of YARNS Cotton AND Warps

We are sure we can give you better work and better service that you can get elsewhere. A trial will convince.

T. BROPHY'S SONS, Jasper St., above Clearfield St., - PHILADELPHIA, PA.

WE DO BLEACHING and DYEING

ESPECIALLY FOR THE KNIT GOODS TRADE

YARNS BLEACHED AND DYED (delivered on cones)
CONE WINDING FOR THE TRADE.

Schuylkill Haven Bleach and Dye Works, SAMUEL ROWLAND, Schuylkill Haven, Pa.

N. B. Bleached Finishing Yarns on Cones for Underwear, always in Stock.

PERFECT FAST BLACK FOR HOSIERY.

The "Dubois' Sanitary" Oxidized Fast Black Dyeing Process with the Lisle Thread Silk Finish, Patented March 17, 1903, and the "Dubois Sanitary" One Dip Fast Black in Powder Form, Leads Them All.

This is the most reliable dyeing formula known to fast black dyers. It has been adopted successfully by many leading mills. It always gives uniform shade, oxidizes well and the fabric is almost as strong as though dyed with direct colors. Most important of all, it gives a fine lisle thread finish without in the least tendering the goods. Beware of cheap fast black formulas, which are sure to be dearer in the end.

The cost of the Dubois black, the best in the market, is very reasonable, as low as $1.40 per 100 pounds dyed in ordinary black for cheap trade, and not over $2.50 per 100 for the very best black for high grade goods, guaranteed to be ungreenable to acid tests and wear. Sulphur and diamine blacks particularly are so much improved after having been lisled by my patented process that they look just as will as aniline oxidized fast black, and yarn costing 17 1-2 cents per pound will produce as fine a looking fabric treated by my process as the genuine lisle thread at a cost of 34 cents per pound.

ALSO NOTICE:—THAT MY ONE DIP SANITARY FAST BLACK IN POWDER FORM is the same black as the Sanitary Oxidize Fast Black Process mentioned at the head of this advertisement, and is a long felt want among the trade, particularly for small concerns whose production would not warrant the equipping of an Oxidize Fast Black Dyeing plant.

The cost per 100 pounds hosiery dyed with this black is from $3.50 to $3.80, according to amount of softener used.

This One Dip Sanitary Black is positively guaranteed to be ungreenable to acid test and wear and leaves the fabric as strong after dyeing as it was in the white.

The apparatus required to start dyeing are but two ordinary wood dyer's tubs and one hydro-extractor.

Those wishing to put on their goods so dyed my "Lisle Thread Finish" (Patented) can do so by simply adding to above apparatus one or more of my "Stationary Oxidizing Machines" (Patented June 10, 1902.)

Dyers and mannfacturers that are far away may procure a license with full instructions for building the machines economically, paying a small royalty for the use. I have made the royalties low, so that NO ONE MAY BE DEBARRED BY REASON OF THE PRICE, but I mean to protect my patents and will vigorously prosecute any who infringe.

Fast black dye and bleach plants for hosiery, underwear and skein fast black yarn dyeing, installed and equipped complete, if desired. Apply to

A. N. DUBOIS or KEYSTONE LAW AND PATENT CO.,

2170 Sedgeley Ave., Phila., Pa. Betz Bldg., So. Broad and Market Sts., Phila., Pa.

PENNYPACK YARN FINISHING CO.,
HOLMESBURG, PHILADELPHIA, PA.
Mercerizers, Bleachers, Dyers and Coners of Yarns.
Correspondence Solicited.

PROVIDENCE MILLS COMPANY,
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BLEACHERS AND FINISHERS
Correspondence Solicited. OF ALL CLASSES OF LINEN GOODS. Toweling and Damasks a Specialty. Telephone Connection.

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Does the Best Bleaching at the Most Reasonable Rates?
TURKISH TOWELS, SKEIN YARN, TAPE, UNDERWEAR.
Send us a sample, we will show results and quote prices.
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SEND YOUR YARNS TO US TO
Mercerize
Our process insures Strength, Brilliancy, and Perfect Condition.
The Blissville Mills, Inc.
NORWICH, CONN.

Established 1881.
Peter B. McManus, Prest. and Treas. Peter B. McManus, Jr., Asst. Treas. Edw. J. McCaughey, Secy.
HOME BLEACH and DYE WORKS, Inc.,

DYERS AND BLEACHERS OF COTTON YARNS
Fast Colors for the Woolen Trade. Capacity 20,000 lbs. per day.
Office and Works, Pawtucket, R. I.

MARYLAND BLEACH AND DYE WORKS,
BALTIMORE, MD.
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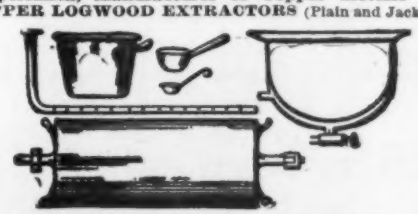

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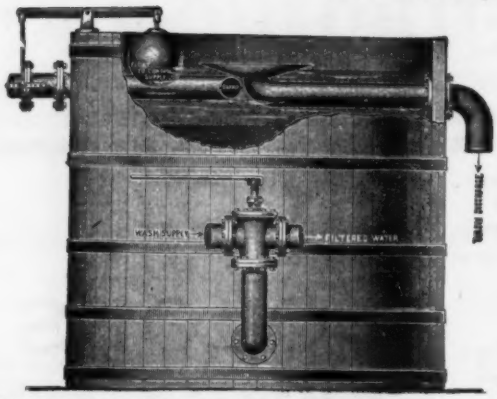

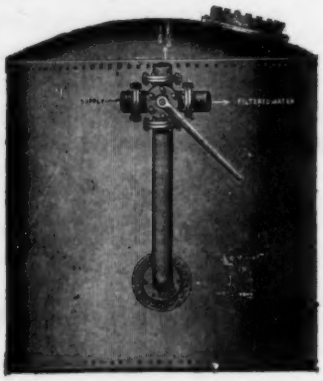

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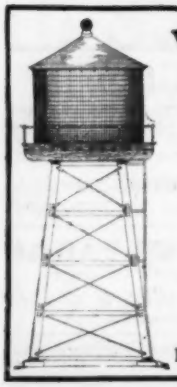

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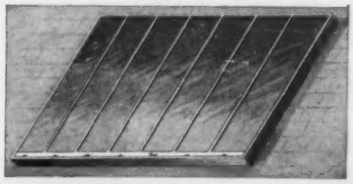

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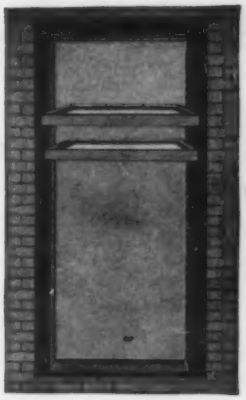

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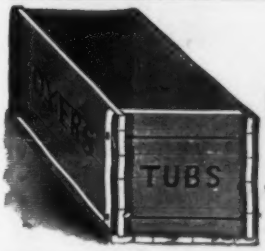

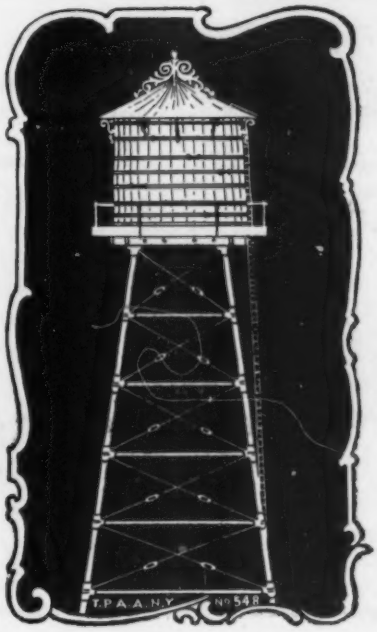

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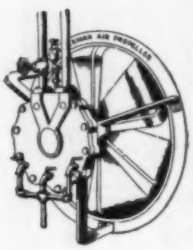

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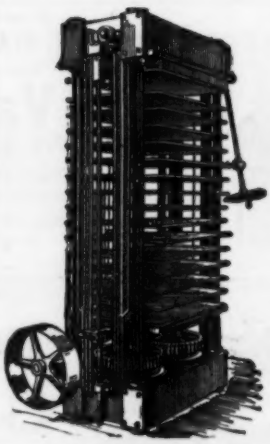

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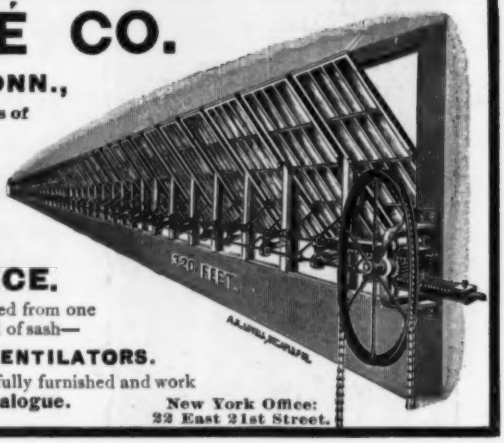

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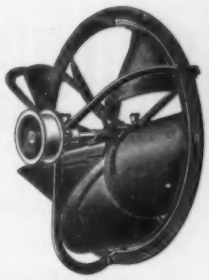

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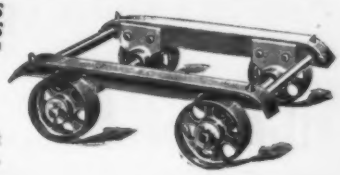

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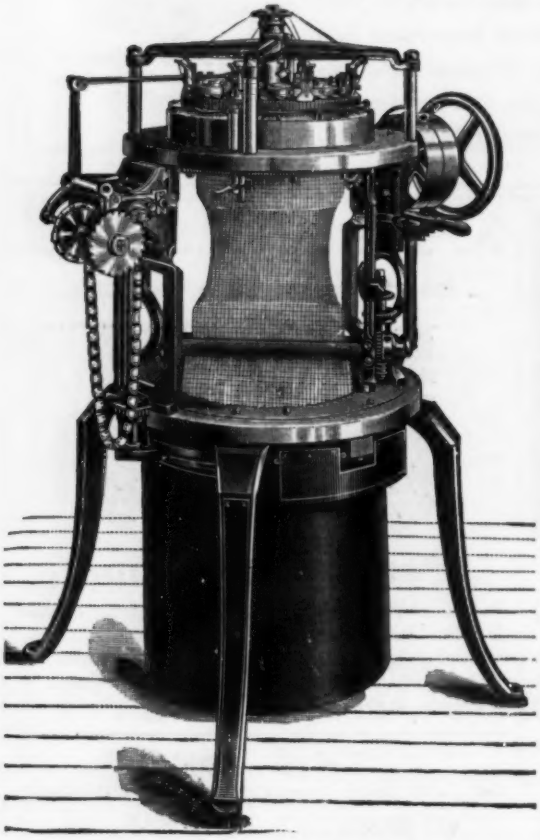

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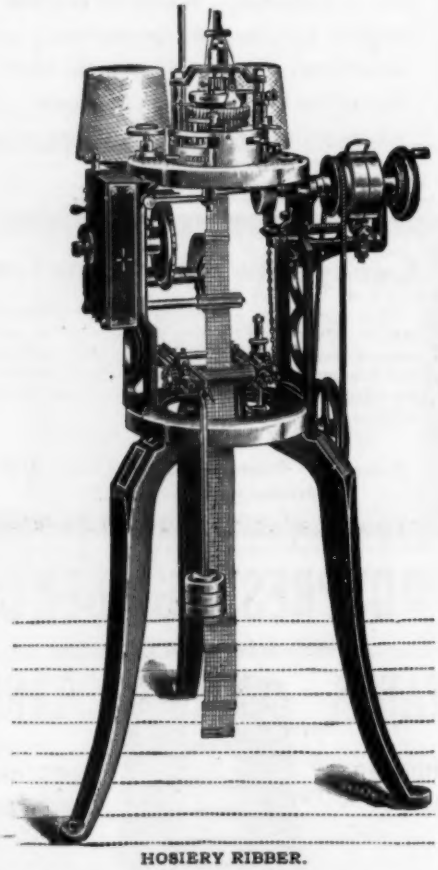

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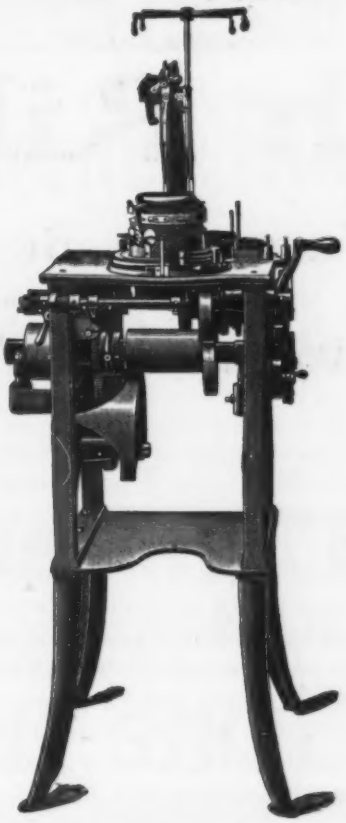

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Its METHOD of TRANSFERRING is still the best.

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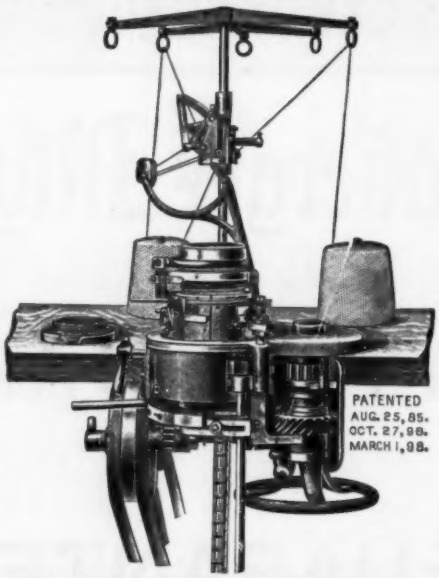


Full Automatic Knitting Machine

"The Knitter That Knits."

Leads Them All.

Write for Catalogue.

Philadelphia Office, ROOM 870 BOURSE.

E. JENCKES MFG. CO.

Factory and Main Office, PAWTUCKET, R. I.

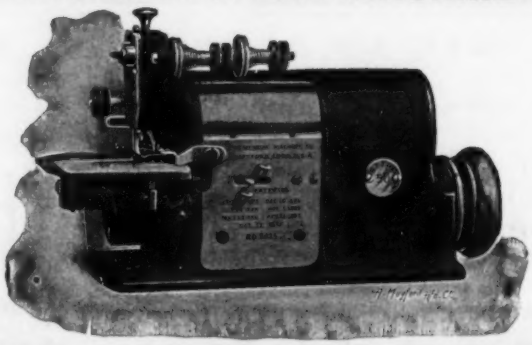
Southern Agent R. M. OATES, Hendersonville, N.C.

THE CHEAPEST and BEST METHOD OF

FINISHING RIBBED KNIT GOODS

IS BY THE USE OF

OUR HIGH SPEED MACHINES.



BLANKETS, SKIRTS or COTTON GOODS,

requiring a useful and Ornamental Finish, should be finished by some of our various machines adapted for special purposes and finishes.

Send for Catalogue and Samples, stating the kind of goods to be finished.

THE MERROW MACHINE CO.,

346 Broadway, New York. HARTFORD, CONN. Bourse Bldg., Phila.

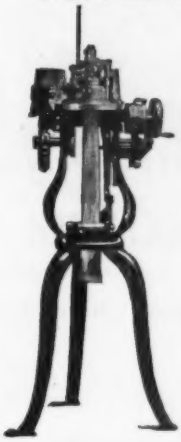
CRANE MFG. CO.

SUCCESSORS TO

PEPPER MACHINE WORKS

Lakeport, N. H.

Manufacturers of



Knitting Machinery,

INCLUDING

Pepper's Flat Ribbed Cuff Machines,

Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

Golf and Bicycle Stocking Machines,

ALL KINDS OF

CIRCULAR RIBBED MACHINES

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins. Correspondence Solicited.

CHARLES COOPER,

BENNINGTON, VERMONT.

MANUFACTURER OF

Knitting Machinery

Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder. **Spring Needle Cylinder Rib-Top Machines,** for making Cuffs, Drawer Bottoms and Shirt Borders. **Spring and Latch Knitting Needles, Burr Wheels, Burr Blades, Sinkers, Jacks, etc.**

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European Office, 15 Newarke St., Leicester, England.

C. J. SIBBALD, General Representative, 757 River St., Troy, N. Y. Telephone No. 547-M.

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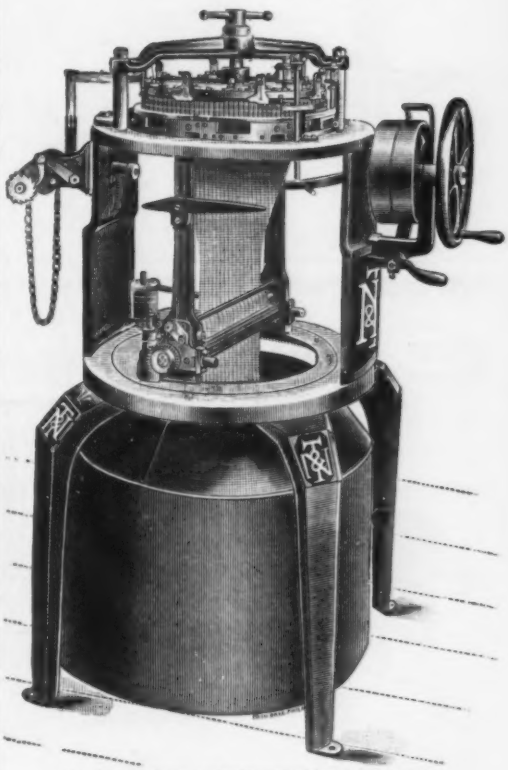
NYE & TREDICK CO.

Circular Rib Knitting MACHINERY

For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. : ; :

Correct Construction. Excellence and Durability.



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QUALITY OF FABRICS AND PRODUCTION

UNEXCELLED

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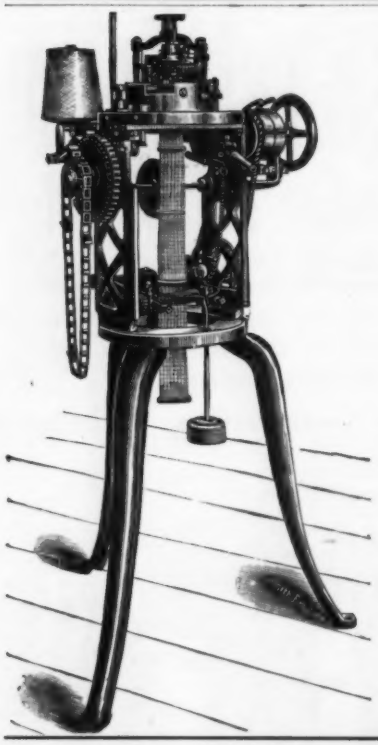

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213-215 Race Street, Philadelphia, Pa.

BUILDERS OF

Knitting Machinery

For HOSIERY and UNDERWEAR.

Complete Estimates Furnished. Send for Particulars.

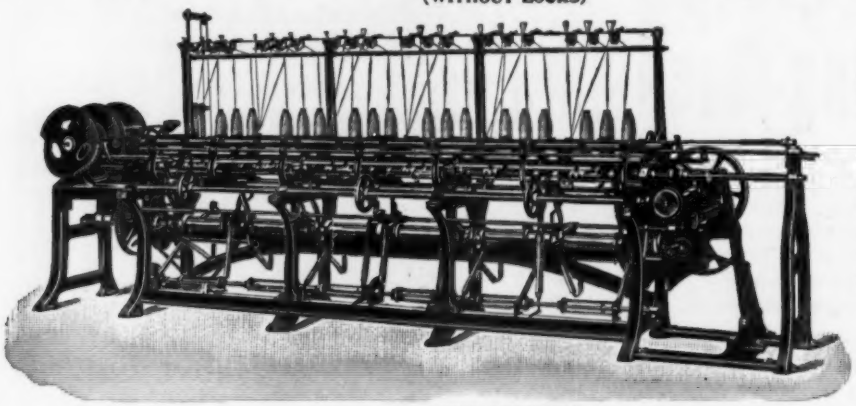
The cut shows our **Improved Automatic Ribber** with Welt and Slack Course for Half Hose, Tops and Ribbed Legs.

WALTER SCHOEBEL, 101 Ralph St., BROOKLYN, N.Y.

SOLE AGENT FOR THE UNITED STATES FOR

NEW The "Record Narrowing" Flat Knitting Machine NEW

(WITHOUT LOCKS)



The "Record" excludes any breaking of needles.

The "Record" runs very lightly and with the greatest quietness.

The "Record" narrows after a new method.

HIGH PRODUCTION.

BUILT SOLELY BY

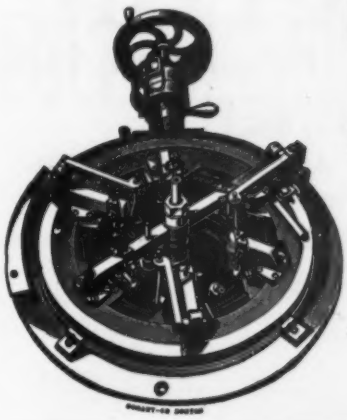
IRMSCHER & CO., Dresdener Knitting Machine Factory, DRESDEN, SAXONY.

This new invention, working after an entirely new method, is a combination of the COTTON and FLAT Knitting Machine with Automatic Narrowing Apparatus, for the production of full fashioned goods, seamless legs of ladies' hose, plain, seamless drawers, Shaker and cardigan sleeves, etc.

"THE RECORD" is also built without narrowing attachment for making 2 and 2 ladies' vests, shaker bodies, sweaters in 1 and 1 half and full cardigan, rib tops, etc.

All goods produced on the "Record" have more elasticity and are of finer manufacture than any other machine of its kind.

SPECIAL HAND AND POWER MACHINERY FOR FANCY GLOVES, SWEATERS, GOLF HOSE, LADIES' BLOUSES, ETC.



CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete, for

Ribbed Underwear, Sweaters, Cardigans, Cuffs and Anklets.

The Leighton Circular Machines are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

Also Builders of ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO.,
Manchester, N. H.

Latch Needles

For all Knitting Machines.

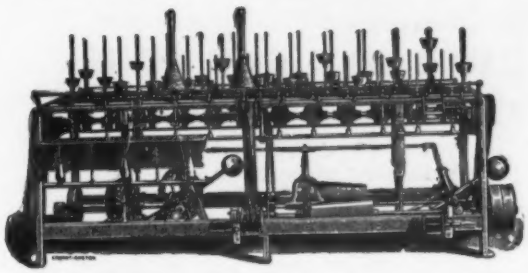
Our Superior or Sunken Rivet Head Needles

Will save you money every day in the year.

Dodge Needle Co., Manchester, N.H.

We now build, with or without differential motion, for winding on Bobbins from Skein or Cop,

THE ABEL WINDERS



ALSO THE

Abel Seamers and Loopers

IN CONNECTION WITH OUR LINE OF

AUTOMATIC RIB KNITTING MACHINERY.

LEIGHTON MACHINE CO., Manchester, N. H.

JAMES TAYLOR,

835 Arch Street, - - - Philadelphia, Penn.

KNITTING MACHINERY

OF ALL KINDS. NEW AND SECOND HAND.

A RARE OPPORTUNITY TO BUY.

50 New Victors, various sizes.
28 Beattie & Hepworth loopers.
3 Cornely embroidery machines.
10 Hosiery presses (Lever).
3 Screw presses.
2 Hollow plate presses.
40 Lamb and Grosser flat knitters.
150 Ribbed underwear machines, various sizes and makes.
1 Speed lathe.
1 Sensitive drill.
60 Brinton & Co. ¾ aut. knitters, sizes.
27 Standard A machines, 3¾ in., 160 needles.
56 Union Special machines.
100 Brooks welters.
98 Brinton & Co. and other make hosiery ribbers.
1 Plant of Mayo machines.
40 Ribbed shirt machine cylinders and dials, all sizes, cuts and makes.
1 Payne winder, 24 spindle.
50 National spring needle machines.
1 Sandusky mangle, 60 inch.
1 250 doz. Cyclone hosiery dryer.
1 24 inch belt driven extractor.
4 Old style Jackson winders.
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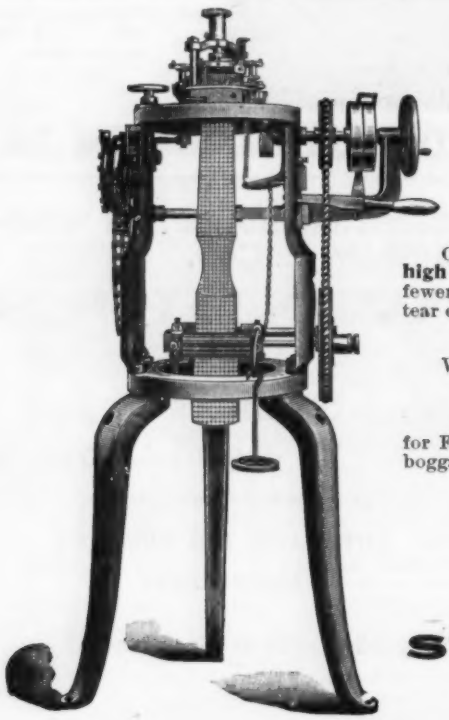
1 Industrial over-seamers.
1 Complete plant N. & T. underwear machines.
5 Band Folding and Cutting machines.
1 Allen skein winder.
1 Payne 12-spindle skein winder.
1 Silk Spooler for 3 inch spool.

WRITE FOR COMPLETE LIST.

We are always in the market to buy good second-hand Knitting and Finishing Machinery.



High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at **very high speed**, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

STAFFORD & HOLT,

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FULL-FASHIONED HOSIERY MACHINERY

.. BUILT BY ..

Chemnitzer Wirkwaaren-Maschinenfabrik

(Formerly SCHUBERT & SALZER)

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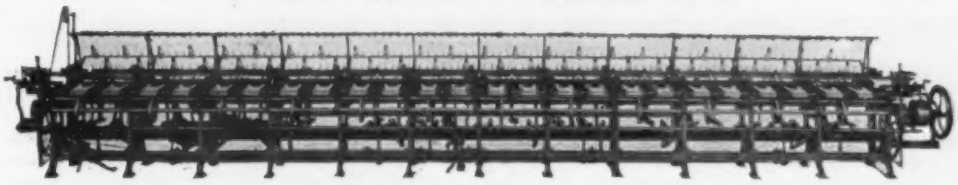

HALF-HOSE LEGGER OF 24 SECTIONS.

All classes of flat work machines for full-fashioned hosiery in all gauges, from 21, 24, 27 up to 51 guage, from 12-24 sections, also machines for full-fashioned shirts and pants in all guages from 6-10 sections, with narrowing and widening.

Representative: OTTO WALTHER, 591 Bourse, PHILADELPHIA

Universal Cutter Co.

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CUTTING MACHINES

Made to be operated by direct current, 110 or 220 volts.

What electric current have you?

UNIVERSAL CUTTER will do the work BETTER and cut a GREATER quantity of Knit Underwear, or Fleeced Materials, than any other Cutting Machine on the market. : : : :

Made in 3 sizes Circular Knives:—Gem, 3 1-4 inch Knife, weight 15 lbs.; Prima, 4 inch Knife, weight 24 lbs.; Giant, 5 1-2 inch Knife, weight 27 lbs. Two sizes straight or Reciprocating Knives. Send us sample of material you desire to cut, stating thickness you want to cut at one time, and we will advise you as to which size is best adapted to your wants.

SMALL RIB MACHINES
CROCHET MACHINES

NATIONAL

SHELL STITCH
MACHINES

Spring Beard Needle Machine
For SEAMLESS HOSIERY, Plain and Novelties

Automatic Rib Machine
For RIBBED UNDERWEAR. All Styles and Gauges

Over Seam Machine "Champion Improved"
For Welting Seamless Hosiery. Covering Raw Edges of Rib Fabrics.

NATIONAL AUTOMATIC KNITTER CO.
SEND FOR FULL PARTICULARS
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Stanton & Lewis
CENTRAL STEAM FORGE
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The best equipped shop in the United States for the Manufacture of
Knitting Machine Cylinder
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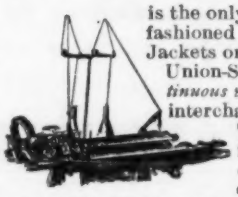
The Grosser PATENT FLAT KNITTING MACHINE



is the only reliable machine for full-fashioned Sweaters, Cardigan or Golf Jackets or Vests, Gloves, Underwear, Union-Suits, etc., that gives *continuous* satisfaction. All parts are interchangeable on our new style. The only automatic Machine for Jacquard Honey-Comb or Seamless Shaker Sweaters. We have the only first class High Speed 2 thread Lockstitch Overseamer for selvedged Knitgoods, that will sew in Sleeves or hem in double Bottoms on Sweaters without puckering. *ARTHUR MUELLER, 780 Madison St , Brooklyn, N. Y. Telephone 665a Bushwick.*

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Full Fashioned Knitting Machinery
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Builders of
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Complete
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PAXTON & O'NEILL'S

3-4 AUTOMATIC KNITTER

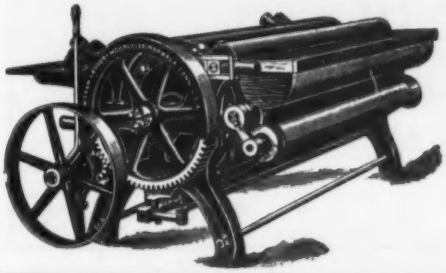
FOR ALL KINDS AND GUAGES OF SEAMLESS HOSIERY.

Has the preference wherever used over 7-8 and full automatics. Because it makes as much or more goods and better goods. Costs less for repairs. Gives less trouble to fixers. Range on Half Hose, from the coarsest to 260 needle.

Exclusive rights to BROWN'S ATTACHMENTS FOR LACE EFFECT.

Cylinders and Dials for all size Machines. **127 Bread Street, Phila.**

AUTOMATIC IRONING and PRESSING MACHINE for KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

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Patent Single-Stitch

LOOPING MACHINE.

Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

Single and Double Stitch, or Both Combined.

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BOARDS FOR FAST BLACK DYERS.

HOSIERY FINISHING BOARDS.

BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

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Hosiery Boards.

EXCELSIOR KNITTING MACHINE MFG. CO.

BUILDERS OF

Full Automatic Knitters

WITH

Transferring Device

ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

MEADOW AND WASHINGTON STREETS ALLENTOWN, PA.

An Effective Label well put on, wire costing one cent per 1000 stitches.

Complete Outfits of

Printers Machinery

Book Binders Machinery

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An extract from purchaser's letter:

Gentlemen:—
Since using your Brehmer Wire Stitching Machine, we have impressed on each garment over 2000 dozen at a cost of only 40c. outside the price of machine. Whereas the same amount of pin-fastners would have cost us $13.20.

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Machinist,
Repairs to Hosiery and Underwear Machines, Cylinders and Dials of every description.

FINE MACHINE WORK.

22 Armat Street, near Main, Germantown,
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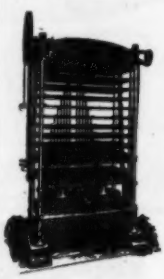
We HARDEN all CYLINDERS and DIALS large and small.

The CRAWFORD



HOLLOW STEAM
PLATE PRESS
For Knit or Woolen Goods.

The most reliable machine of the kind on the market.

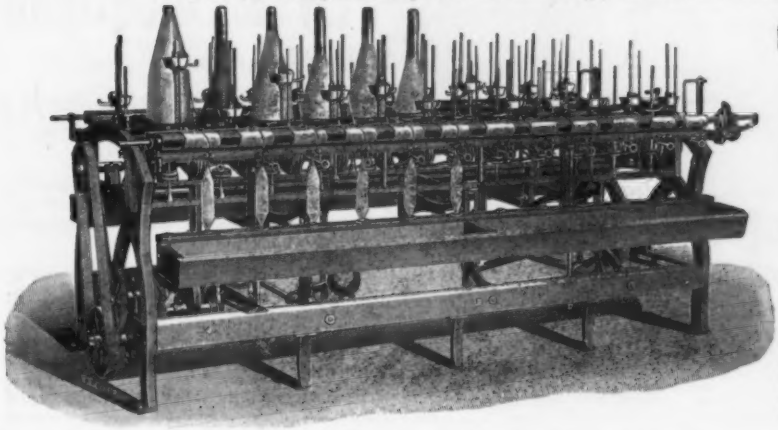
PRESS PAPERS and FENDERS.

SPENCE & RIDEOUT,
Successors to
J. J. CRAWFORD & SON,
NASHUA, N. H.
Established 1868.

GEO. W. PAYNE, Prest. J. MILTON PAYNE, Treas. CLINTON F. PAYNE, Sec'y.

OVER 1,650 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



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Builders of the.

Improved

Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers, for doubling 2, 3, or more ends into one,

Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

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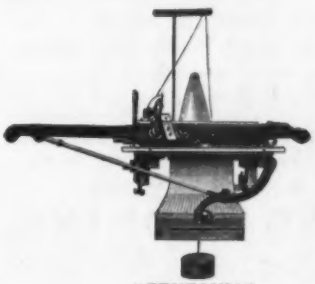
The simplest machine of the kind ever built. A small bench machine running with a 3-4 inch belt. Can be used with two cylinders, or transfer points if desired. Positive thread splice. All parts interchangeable. Call and see it in operation in our offices.

MANUFACTURERS OF LATCH NEEDLES

We can furnish you needles for any make of machine that you use. We number among our customers, the best known mills in this country. We will be pleased to estimate on any line.

KEYSTONE KNITTING MACHINE MFG. CO., 2600 North Sixth St,, Philadelphia, Pa.

SEYFERT & DONNER, CHEMNITZ, GERMANY.



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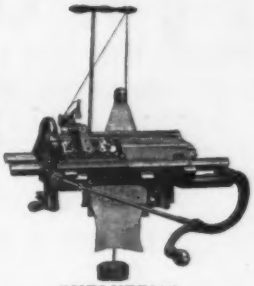
BUILDERS OF ALL KINDS OF

Flat Knitting Machines

(LATCH NEEDLES.)



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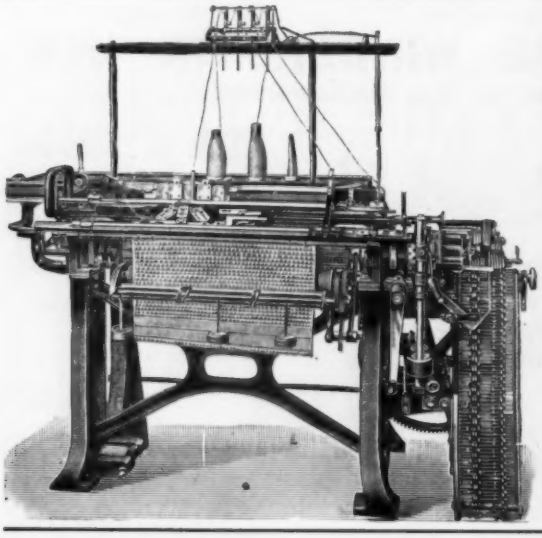
More than thirty different Models of **Hand Knitting Machines.** Special Machinery for Fancy Gloves, Fronts of Cardigan Jackets, Golf Hose, Sweaters, etc., etc. **Patentees and Sole Makers of the "TEUTONIA" KNITTER** the very best hand-machine for the manufacture of plain, seamless hose and half hose with Griswold heel, narrowed leg and toe. **FULL AUTOMATIC POWER KNITTING MACHINES, Independent Heads,** for making Rib Tops, Sweaters in 1 and 1 and Half Cardigan Rib, 2 and 2 Ribbed Ladies' Vests, Scarfs, Shirt and Shaker Bodies, etc. **FULL AUTOMATIC FANCY JACQUARD KNITTING MACHINES, Power Motion. AUTOMATIC NARROWING MACHINES—Power Motion—3, 4, 6, 8, 10 heads** for making plain, seamless legs of Ladies' Hose (full fashioned), plain, fashioned seamless Pants and Sleeves, Ribbed Pants and Sleeves, Cardigan Jackets, Cardigan Sleeves (narrowed and widened), etc.

Sole Agent for the United States, JULIUS MULLER, 132 Melrose Street, Brooklyn, N.Y.
Reduction of Prices on Hand Machines of all kinds.



Full Automatic NOPPEN & JACQUARD MACHINE

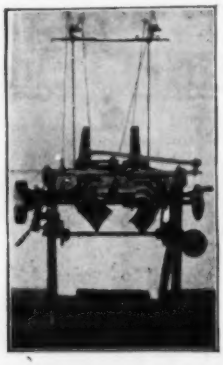
For High-Grade Sweaters, Jerseys, Etc. in latest plain and colored patterns.

Most durable, simplest construction! Easy to operate and adjust! Recognized as the Best in the market. One operator attends to 3 of these machines! Only reliable machine for above articles.

HIGH SPEED! LARGE PRODUCTION!
IN USE EVERYWHERE!

CLAES & FLENTJE Mühlhausen, Thur, GERMANY.

Ask for samples and full particulars. State gauge and size you need.



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LINDLEY'S NEW AUTOMATIC POWER GLOVE FINGERING MACHINE

Germantown Skein Winder and Links for Double Ribs. Cardigan Jacket and Circular Knitting Machines for Shirts and Hosiery.

Cylinders and Dials of all kinds made and hardened. Special Machine and Jobbing Work promptly attended to. Also equipped to do general repairing of Platt's Cotton Spinning Machinery. Correspondence solicited.

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BRUCE
MACHINES AND PARTS

We keep in stock a full line of parts and repairs for the N. H. BRUCE Band Folding and Cutting Machine, Rib Cutter, Neck Marker, Eyelet Machine, etc. **FOLDERS and GUIDES.**

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EDWIN A. NEWTON,
KNITTING MILL MACHINERY AND SUPPLIES,
NEW AND SECOND HAND.
Exclusive Agent for the Hemphill Full Automatic Knitters.
245 Race St., Philadelphia, Pa.
Expert Appraisals on Machinery.

CRANE MFG. CO. Lakeport, N. H.
Spring Needle Circular
KNITTING MACHINE.
For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet.
A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brack ts.

WILLIAM C. BULL, BENNINGTON, VERMONT.

For Ladies', Gents', and Children's Goods.
LATEST STYLES.
BEST WORKMANSHIP.

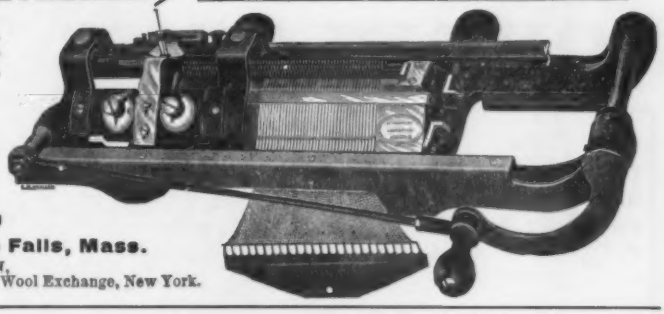
MAKER OF
Drying Form Boards
OF EVERY VARIETY.

The LAMB, LEADER OF KNITTERS,

Original and Still the Best.

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.

CIRCULAR MACHINES,
RIB TOP and
SEAMING MACHINES.

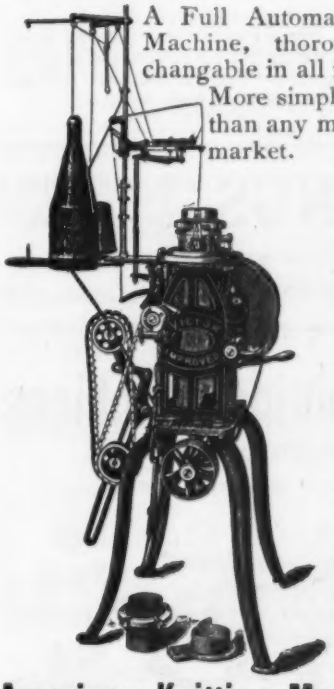


LAMB KNITTING MACHINE COMPANY,

P. O. Box 5888, Chicopee Falls, Mass.

J. E. WOODHEAD, 100 23d St., Chicago.
L. D. SANBORN, Room 505 Wool Exchange, New York.

The "New" Victor Knitting Machine



A Full Automatic Seamless Machine, thoroughly interchangable in all its parts.

More simply constructed than any machine on the market.

Full Automatic Two-Color Striping Machine

Full Automatic Combination Lace and Stripe Machine

American Knitting Machine Co.,

Office and Works:
Oxford Street, between Mascher and Hancock,
PHILADELPHIA, PA.

Standard Machine

Superior to All Others in Economy of Operation, Production and Fabric.

Best Built, Easiest Operated, Superior Fabric.

STANDARD B, Automatic Double Sole and all Improvements.

STANDARD C, the only Automatic Heel and Toe Changer.

STANDARD D, Automatic Striping Machine, none other in the market.

STANDARD MACHINE CO.

508 Ludlow St., PHILADELPHIA, PA.

Estimates Furnished for Complete Hosiery Plant.

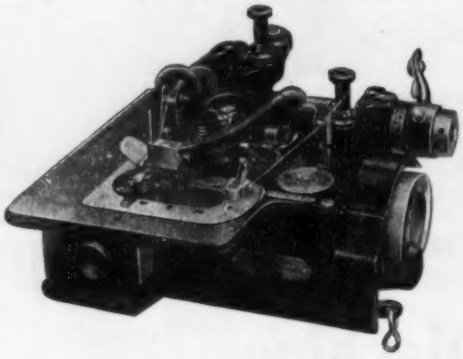
WILLCOX & GIBBS

"OVERLOCK" Machine.

(TRADE MARK.) (Pat. April 5, 1892.)

Patent twice upheld by the U. S. Court of Appeals.

For
Trimming, Seaming (or Hemming or Overedging) and Covering Raw Edges of Knit Underwear and Hosiery
in
ONE OPERATION
and for making
"Overlock" Corded Edge on Lace Curtains, Silks, Ribbons, etc.



WARNING!

Manufacturers and dealers are warned that not only is the "Overlock" Machine fully protected by patents, particularly our four patents of April 5, 1892; one of May 26, 1896 and one of August 11, 1903, but the edging products are also protected by patents of March 10, 1896, Dec. 26, 1899 and August 11, 1903.

Trade Mark Registered

Business Estab. in 1859

WILLCOX & GIBBS SEWING MACHINE COMPANY,

GENERAL OFFICES
TEMPORARILY AT
85, 87, 89 BLEECKER STREET,
CORNER MERCER STREET, NEW YORK.
BRANCHES: LONDON, PARIS, MILAN, DRESDEN.

Until completion of the New 12 Story Fireproof Building,
658 BROADWAY, Corner of Bond St.
THE OLD "WILLCOX & GIBBS" CORNER
where we were located for thirty-five years.

CELEBRATED BRAND PYRAMID TRADE MARK **LACINGS**

For Underwear, Overshirts and Sweaters,

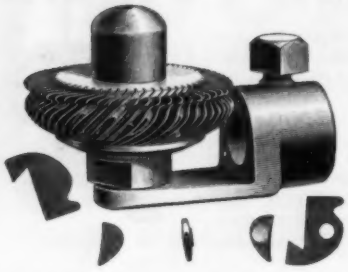
JOHN CATHCART & CO.,
115 Franklin Street, NEW YORK.

LACINGS FOR OVERSHIRTS and UNDERWEAR.

Tipped and Tasseled.

Hepner & Horwitz, 30 Howard St., N. Y.

The Tompkins BACKING BURR
Saves Needles



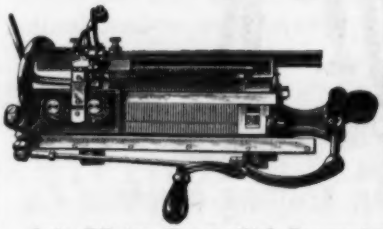
SEND FOR A SET ON TRIAL.

TOMPKINS BROS. COMPANY
Troy, New York

Best Knitting Machines

IMPROVED CONSTRUCTION

For Hand and Power Driving.



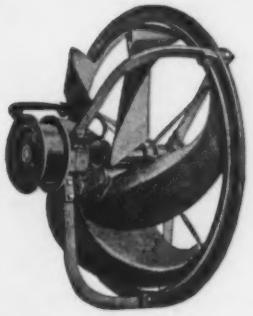
High Speed, Excellent Workmanship.

Auto. Rib-top, Fancy-stitch Jacquard Machines.

Everywhere in work. **80,000** Machines sold.

CLAES & FLENTJE,
Muhlhausen, Thür, Germany.

THE
"DAVIDSON FAN"
MECHANICAL HEATING
VENTILATING & DRYING
MECHANICAL DRAFT
FANS.
MASSACHUSETTS
FAN COMPANY,
WALTHAM, MASS.



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L. T. IVES CO.
Manufacturers of all kinds of
SPRING KNITTING NEEDLES
NEW BRUNSWICK, N. J.

PAGE NEEDLE CO.,
MANUFACTURERS OF
LATCH NEEDLES
of all kinds. Warranted in every respect.
CHICOPEE FALLS, MASS.
Agents: J. E. Woodhead, 100 Twenty-second Street, Chicago, Ill. Durbrow & Hearne Mfg. Co., 12 Wooster Street, New York. James Taylor, 835 Arch Street, Philadelphia, Pa.

WM. BREEDON'S SON,
MANUFACTURERS OF
Spring Knitting Needles
AND BURR BLADES OF ALL KINDS.
AMSTERDAM, - N. Y.

ORION TREAT,
MANUFACTURER OF
Screw Riveted Balmoral and Double Rib
NEEDLES
(Patented May 6, 1890.)
All Work Guaranteed. MANCHESTER GREEN, CONN.

WM. COREY CO.,
Manufacturers of Knitting Machine
Latch Needles,
MANCHESTER, N. H.

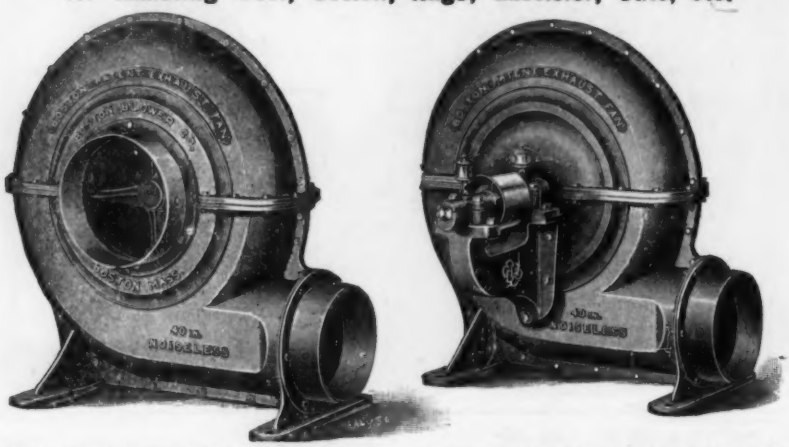
EXCELSIOR NEEDLES.
The best Hosiery Needles in the market.
Manufactured by
WARDWELL NEEDLE CO., Lakeport, N. H.

FREEMAN BROS.
Manufacturers of
Latch Needles
Harmony Block, BRATTLEBORO, VT.
Manufacturers' Supplies Co.
418 ARCH STREET, PHILA.
Needles and Supplies for Knitting Mills.
Agents for EXCELSIOR NEEDLE CO., and NATIONAL NEEDLE CO.

WILFRED WELLS,
Sole Manufacturer of the
CHAMPION HOSIERY STAMP.
PATENTED JANUARY 7, 1896.
The Only Perfect Stamp for Hosiery, Underwear and all Woven Fabrics. BLOCKS FOR PRINTING HOSIERY.
505 W. Lehigh Avenue, . . . PHILADELPHIA, PA.

Boston Wool Exhausters, with Removable Tops.

As used in Connection with Pneumatic Conveyor System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.

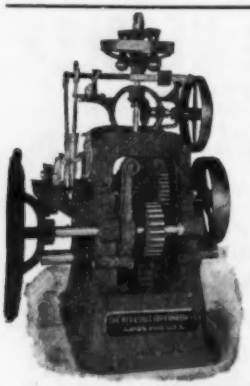


Inlet Side of Right-hand Wool Exhauster. **Pulley Side of Left-hand Wool Exhauster.**

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

BOSTON BLOWER CO., Main Office and Works: **Business and Glenwood Sts., HYDE PARK, MASS.**



WATERWHEEL GOVERNORS

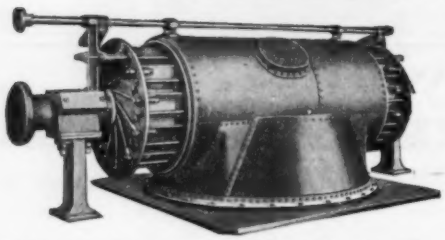
FOR **TEXTILE MILLS**
Electric Light, Power and Railroad Work

We are now prepared to **guarantee absolute satisfaction.** Write for references in your locality.

THE REPLOGLE GOVERNOR WORKS

Broadway and Chestnut Streets, **AKRON, OHIO.**

SAMSON TURBINE



A PATENTED LOCK NUT is used on the bolts which hold the gates in position on the SAMSON. It prevents the bolts from becoming unscrewed and therefore eliminates wear and leakage.

WRITE DEPT. A-5 FOR CATALOGUE.

The James Leffel & Co., **SPRINGFIELD, OHIO, U. S. A.**

"A B C"

HEATING · VENTILATING · DRYING
MECHANICAL DRAFT APPARATUS

CATALOGUES UPON REQUEST

AMERICAN BLOWER CO.

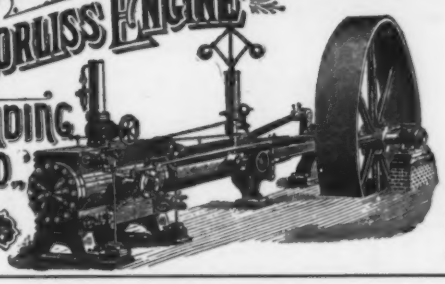
DETROIT

NEW YORK. CHICAGO. LONDON.

THE IMPROVED FISHKILL CORLISS ENGINE

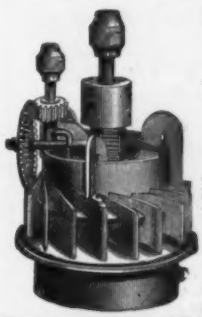
BUILT BY THE FISHKILL LANDING MACHINE CO.

FISHKILL HUDSON N.Y.



Most Efficient and Economical Power in the world For Textile Mills.

It has NO EQUAL for Close Regulation and Noiseless Operation. Send for Catalogue.



TURBINES ON HORIZONTAL AND VERTICAL SHAFTS.

These wheels are specially designed and adapted to TEXTILE MILLS

The records of the Risdon Wheel are not equaled by the records of any other wheel. Average of results of tests in Holyoke Flume: Full Gate, .8694; Seven-eight, .8472; Three-quarter, 8014; Five-eighth, .7601.

RISDON CELEBRTAED TURBINES. ALCOTT HIGH DUTY TURBINE. Unequalled Efficiency. Easy Working Gate. Greatest Power from a Limited Quantity of Water at Smallest Cost.

TAYLOR SLEEVE GATE TURBINE. The largest power ever obtained from a Wheel of the same diameter.

SEND FOR CATALOGUE.

RISDON-ALCOTT TURBINE CO. Mount Holly, New Jersey, U.S.A.

PAIR McCORMICK TURBINES

4,000 H.P., 72 ft. head, arranged to drive generator and a single turbine to drive exciter. Five settings built for the Hudson River Water Power Company's Spier Falls plant and 14 pairs 51 inch for their plant at Mechanicsville, N, Y.

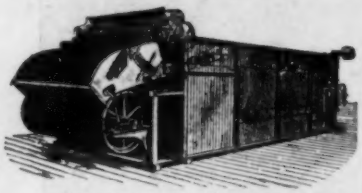
Write for Catalogue if contemplating purchase of turbines.

S. MORGAN SMITH CO.

YORK, PA.

Boston Office, 176 Federal Street.

MAR 17 1904

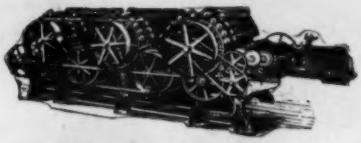


Automatic Cotton Stock Dryer.

Automatic Yarn Dryer.

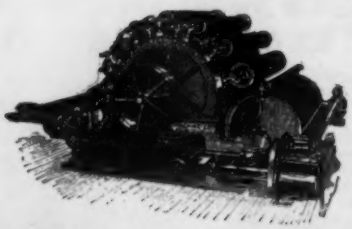
"CYCLONE" DRYERS

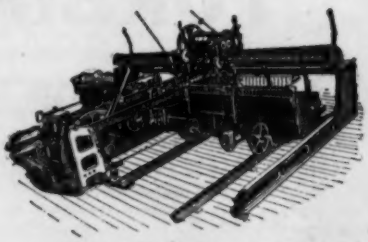
For Cotton Stock, Wool Stock, Rags,
Yarn, Cloth, Underwear, Stockings, Etc.



"PROCTOR"
Garnett Machines and Pickers

For reducing to fibre Cotton and Woolen
Waste, Cloth Clippings, Etc.





"FURBUSH" Woolen Mill Machinery

Including Pickers, Cards, Mules, Twisters,
Warpers, Dressers, Spoolers, Etc.

Manufactured by

THE PHILADELPHIA TEXTILE MACHINERY CO.,

Hancock and Somerset Sts., - PHILADELPHIA, PA.

It's no longer a question

as to whether Textile Manufacturers who sell through dealers can make advertising pay.

The question the manufacturer must answer to-day is "Can I afford to wait longer before joining the ranks of textile advertisers?"

He may say he *can* wait, but if he is interested enough in *his* business to care to know how his competitors make their profits, I suggest that he read a book that tells about it. Its title is

"Advertising Textiles Pays!"

and a copy of it will be mailed with my compliments to any textile manufacturer who is willing to take the risk of being convinced.

More than seven million women a month are being told and re-told of the merits of his competitors' goods through the columns of THE DELINEATOR, THE DESIGNER and the NEW IDEA WOMAN'S MAGAZINE, comprising

THE BUTTERICK TRIO

We have helped such firms as

Lansdowne	Dress Goods	Viyella	Flannel
Passaic Woolen Mills	Dress Goods	York Knitting Mills	Hosiery
Duncan & Stenz	Silk	Black Cat Stocking Co	Hosiery
Skinner Mfg. Co.	Silk	Shaw Stocking Co.	Hosiery
Rochambeau Silk Co.	Silk	Lord & Taylor	Onyx Hosiery
J. & J. M. Worrall	Nonpareil Velvet	Lewis Knitting Co.	Underwear

and many others create a profitable demand for their goods. We can make a successful advertiser out of *you* if your goods are good.

We'll do most all of the work if you let us.
Better write me for that book about your business anyway.

THOMAS BALMER, Advertising Manager
BUTTERICK BUILDING, NEW YORK
W. H. BLACK, Western Advertising Manager, 200 Monroe Street, Chicago, Illinois

The June issue, for which we are now taking copy, appears May 10th, and forms close April 10th.

COUNTED P E

JAMES SMITH WOOLEN MACHINERY CO.

411 to 421 Race Street, Philadelphia.

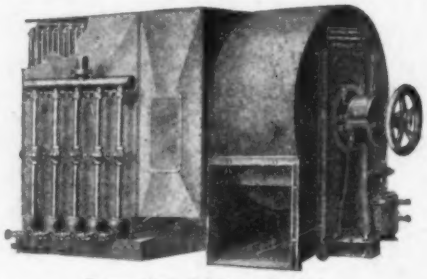
Woolen Machinery

FOR

Carding, Spinning, Wool Washing, Carnetting, Pickering, Drying, Burring, Cleaning, Finishing.

Cotton Batting and Waste Machinery.

FOR MORE COMPLETE LINE SEE PAGE 39.



Economical—Efficient—Reliable

THE BUFFALO

——FAN SYSTEM——

Of Heating — Ventilating — Drying and Humidity Control

Used by America's Foremost Textile Mills. *Send for List.*

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BUFFALO, N. Y.

NEW FOSTER CONE.

Open wind from start to finish of Cone.

No press-offs from knots, over-winds, etc.

The only perfect system of winding yarn for knitting purposes.

Over 30,000 spindles in use in the U. S.

FOSTER MACHINE CO.,

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HIGH PRESSURE

VALVES AND FITTINGS

"Walmanco" Pipe Flanges,
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